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HOLE IN MACULA IN NEGRO. BURKHOLDER'S CASE.

AMERICAN JOURNAL OF OPTHALMOLOGY

Vol. I FEBRUARY, 1918 No. 2

HOLE AT THE MACULA.

LIEUT. CHARLES A. BURKHOLDER, M. D., M. R. C.

BASE HOSPITAL, CAMP SHERMAN, OHIO.

Report of case probably of traumatic origin occurring in a negro. Illustrated by colored drawing and one figure in the text, and with a bibliography.

Knapp[1] in 1869 and Noyes[2] in 1871 were the first to call attention to an anomaly of the fundus consisting of a circular punched-out hole in the macular region, but it was not until after the studies of Kuhnt and Haab in 1900 that case reports of this interesting condition became fairly numerous.

H. D. S., a negro, age 27 years, came into the service of Major Casey A. Wood at the Base Hospital, Camp Sherman, Ohio, complaining of poor vision in the right eye with a spot in the line of vision which had become quite troublesome. He admitted that the sight in the affected eye had always been poor, but he could not remember just when it began to fail. When a young boy he received a violent blow on the right eye with a corn cob and for several days following was almost totally blind in the injured eye. The patient thought, however, that the vision had not been good for some time previous to the accident. He gave a history of the usual diseases of childhood, but was otherwise healthy with the exception of an attack of "scrofula" at ten years of age. At 22 the patient was taken sick with what was diagnosed as syphilis. Although he denied a primary lesion, he gave a history of body rash, some sore throat with other symptoms which might be construed as secondary signs. The patient himself thinks that this attack was of a tubercular nature, as he had a bad cough with profuse expectoration. He admits three attacks of gonorrhea. Although married four years he has no children. His wife has had two miscarriages and has been in poor health for the last two years. Both parents of the patient are living and have good eyesight.

Physical examination of the chest was negative.

Wassermann was negative.

Urine negative for albumin and sugar.

Blood examination showed 4,169,000 red and 8,600 white corpuscles. The differential count showed no variation from the normal.

Examination of the eyes showed:

Vision, O. D. 8-200

O. S. 20-15.

Refraction under a mydriatic gave 1 diopter of hypermetropia in each eye.

Right cornea negative.

Iris was not adherent to cornea or lens.

Vitreous was clear.

The lesion as shown in the accompanying illustration consists of a large circular excavation slightly larger than the disc, located in the macular region. The excavation is about one millimeter deep with precipitous and sharply marked pigmented margins. The floor of the excavation is of a deep red mottled appearance, with a few grey-

ish white spots showing through. Surrounding the hole and closely approaching the edge are the greyish white retinal margins which gradually extend into the normal retina. Numerous crystals of cholesterin are imbedded in the floor of the hole and the surrounding retina. No cholesterin crystals are discernible in the vitreous. The nerve head is apparently normal.

The visual fields show a slight contraction of form and colors with total loss of green vision. There is a large central scotoma corresponding to the lesion in the macular region. The left fundus is normal to all appearances. There are no cholestrin crystals in the left fundus or vitreous.

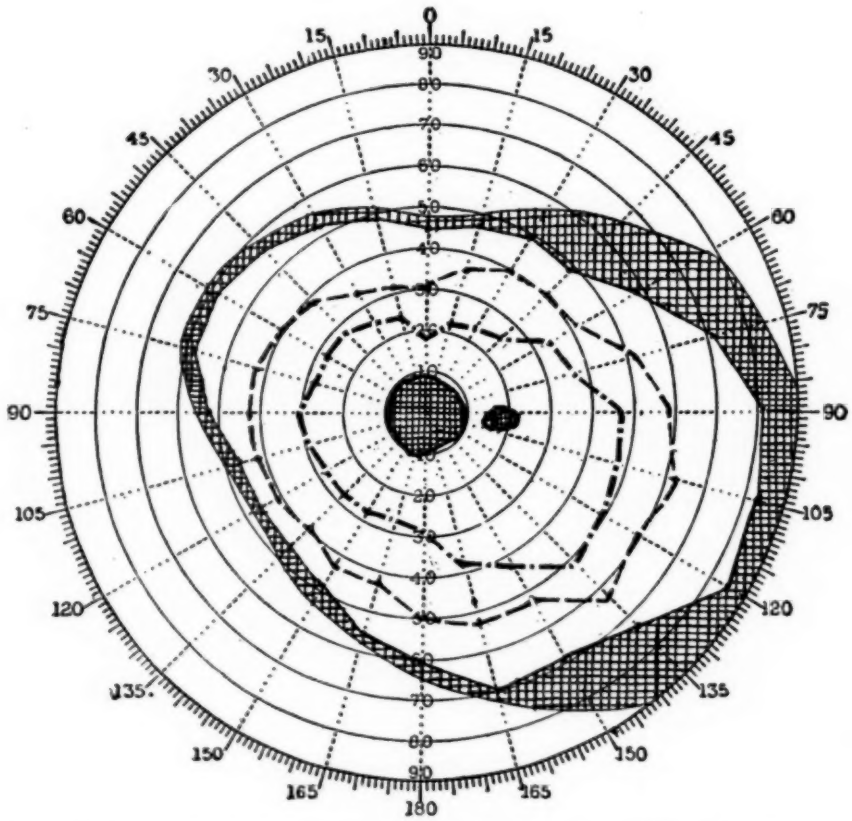

Fig. 2.—Field of vision, Burkholder's case of Hole at Macula. The outer broken line represents boundary of field for blue. Inner broken line field for red.

The pathology of macular hole as studied by Fuchs,[3] Coats,[4] v. Hippel,[5] and others seems to point to a cystic degeneration in the retinal layers with subsequent rupture and formation of a hole.

Coats thinks that this degeneration is due to an edema of the retina at the posterior pole involving usually all of the layers of the retina, but may produce a retinal hole from edema of the inner layers only.

Fuchs points out that the pathology may be the same whether due to traumatic or inflammatory changes. There may be cystic formation followed by pressure atrophy or rupture and hole formation. He also considers that a contusion might result in serious molecular changes and death of the cells with absorption without edema or cystic formation.

Twietmeyer[6] reported two cases in 1909 which were caused by contusion

of the eye ball. The injury was followed by a punched-out hole with a red base in the macular region.

One of his cases is of importance because the observer saw the patient immediately following the injury, at which time the macular region was opaque and the veins tortuous and full. In about three weeks this condition changed to a typical hole at the macula.

R. Foster Moore[7] (1910) reported a case of concussion of the eye ball the ophthalmoscopic examination of which showed a hole in the macula 1⅓ the size of the optic nerve head. The opposite side showed a similar condition, but there was the appearance of bright red holes with shelving edges and many whitish areas of all sizes scattered about this region.

A. C. Clapp[8] (1913) reported a case of macular hole following a contusion in which there were numerous deposits of cholesterin crystals in the vitreous as well as the fundus.

Zentmayer[9] in 1909 and de Schweinitz[10] in 1904 reported cases of macular hole of nontraumatic origin. The lesion has also been observed following postoperative iridocyclitis.

Whether or not the lesion as described in this case report was caused by an injury, or is the result of some inflammatory process, it is impossible to ascertain on account of the uncertain history furnished by the patient.

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GLAUCOMA FROM THE ABSORPTION OF SENILE CATARACT.

HAROLD GIFFORD, M. D., F. A. C. S.

OMAHA, NEB.

A paper discussing the relations between these two conditions and reporting four additional cases of such sequence, read before the Third Colorado Ophthalmological Congress, August 10th, 1917, with discussion.

The spontaneous cure of senile cataract is by no means so rare as is commonly supposed, or as would be inferred from the statement of Hess, in the last edition of the Saemisch Handbook, that to date, over sixty cases of this sort have been reported. I have seen ten cases in which practically complete absorption of the cortex has occurred. In three of these, useful sight was obtained V = 20/70, 20/100 and 20/200 respectively. In six others the conditions would have allowed useful vision if they had not been complicated with glaucoma. This tendency for senile cataracts to undergo spontaneous absorption is so common that I think it may safely be said that while every one would develop a senile cataract if he lived long enough; so also would every one obtain a spontaneous cure, if life were sufficiently prolonged. Unfortunately, nature's method of cure does not give a good percentage of visual results. The frequency with which glaucoma is associated with the absorption of senile cataract has been noted by Mitvalsky[1] and Reuss[2], and

more recently by Verrey[3]; but these writers have concluded that the glaucoma or some inflammatory complications are the cause of the absorption of the lens, while in my opinion the case is the other way around. I believe that the spontaneous absorption of the cortex of a senile cataract produces, in many cases, an increase of tension which may be temporary and unnoticed; or which may lead to complete blindness; in which case the absorption of the lens is commonly attributed to the influence of the glaucoma. In my previous paper[4], in which I reported four cases of spontaneous cure of cataract, out of which three were complicated with glaucoma, I based my belief on the fact that in two of the cases the eye had been seen with a mature cataract without any signs of glaucoma some time before the absorption of the lens, and that after the absorption of the lens and the onset of the glaucoma, the other eye had been followed from two to seven years without the appearance of any signs of glaucoma.

Since that time I have seen four other cases of spontaneous cataract absorption associated with glaucoma; and from the continued observation of some of my previous cases I can give decidedly more positive proof of the dependence of the glaucoma on the absorption of the cataract.

In one of my previously reported cases, Case 1, a man of sixty-three had a preparatory iridectomy done on the left eye for an uncomplicated immature cataract. The patient returned after five years, with the left eye absolutely blind from glaucoma, with the lens all absorbed except a small brown nucleus. I followed this man for twenty years, at the end of which time a cataract matured in the other eye, and was expressed with a good result, without any signs of glaucoma having developed. Another patient of this old series, Case 2, who at the time of the report, had a spontaneous cure of cataract, with vision of 20/70, later developed glaucoma on account of the nucleus getting into the anterior chamber, and was cured by an extraction. This case should of course, be placed in a different class from those in which the glaucoma is the direct result of the absorption of the lens without any dislocation.

In a third of these older cases, Case 3, a woman of sixty-five years, with nearly mature uncomplicated cataract, reported again after two years, with the cortex absorbed, a small nucleus sunk down so as to leave the upper third of the pupil free and the eye absolutely blind from glaucoma. The other eye had had a cataract removed ten years before with resulting vision of 20/50 and no signs of glaucoma in that eye; nor did any such signs appear in the next few years during which I kept track of her.

In some of my more recent cases I have an almost continuous record of the conditions before, during and after the occurrence of the glaucoma and the absorption of the lens.

Case IV, F. J. T., male, 47 years, seen first 3-29-1911. Right eye, mature cataract; V = hand movements three feet, good projection. Left eye, slight lens opacities, V = 20/15—. After about three years, this patient was seen again and although the right lens, with undilated pupil, showed no decided change, its projection was found to be so poor that patient was advised that an operation would probably not be worth while. There was nothing unusual about the appearance of the eye and the tension was not tried at this time. In 1915 the tension became decidedly high (59mm.), with considerable pain and congestion. A trephining was done with some reduction in tension and disappearance of the pain and congestion. On 5-27-16 the tension was still high (51mm.) and it was plain that the lens was undergoing absorption; most of the cortex was absorbed and the iris was tremulous. Extraction and iridectomy were advised, but the case has not been seen since then. During the five years period of observation the other eye retained vision of 20/15 with absolutely no sign of glaucoma. I realize that this case could be quoted on either side of the question, but if the cataract had been examined with a dilated pupil when the projection was first found to be bad I

believe that signs of beginning absorption of the cortex would have been detected; and that the increased tension was the result of the continuation of this process.

The same remarks apply to

Case V, woman 54, seen by my colleague, Dr. Patton, on 6-25-1915. Right eye, cataract of some years standing, tension 51, cornea steamy, exact condition of cataract not ascertainable. V. not noted but very poor. Posterior sclerotomy was done and patient was not seen again until 5-31-16. She returned with an acute iritis in the right eye and was given atropin; a few days later I found the pupil dilated enough to show that the cortex of the lens had been absorbed and the small nucleus was low down in the posterior chamber. Later on it appeared in the anterior chamber and was removed with the loop, on account of persistent symptoms of irritation, although the tension had sunk to normal or thereabout. The eye was blind. The other eye had had a cataract removed from it eight or ten years previously and in 1917 showed vision of 20/30+ with no signs of glaucoma.

Case VI, male 69, first seen 6-15-14. Right eye, old milky looking cataract; projection poor; divergent strabismus. The projection of this eye was so poor that it was not deemed best to operate on it and as the left eye, in addition to cataract had dacryocystitis and ectropion of the lower lid, the sac was destroyed, the ectropion cured and after some months the lens expressed with a good result. While at the hospital, the blind right eye got painful and hard. A trephining was done but the hole was made too far back and the iris did not prolapse. The eye became painless but still had some tension on his return to his home in Montana. For the subsequent history of the case I am indebted to his home oculist, Dr. W. A. Walters of Billings, Montana, who wrote me that soon after he reached home he developed what seemed to be an irido-cyclitis in the right eye with some precipitation in the anterior chamber; high tension and steamy cornea. When the acute symptoms subsided, after a few weeks, the tension became normal, the sight began to improve, the cortex of the lens was found to be practically all absorbed, with a sunken nucleus; and the eye had vision of about 20/200 which has been maintained without any further increase of tension. The left eye continues good with no signs of glaucoma.

Case VII, male, operated by me for senile cataract of the left eye in 1906, at the age of 56; resulting vision 20/20+. The right eye became slowly blind from developing cataract in the course of the ensuing years but I did not see him again until 5-22-17 when he returned stating that on the day previous, the right eye (the unoperated one) suddenly became very painful and congested with diminution of what little sight he had previously had. I found the left eye to be still in perfect condition; V = 20/20+ with correction. The right eye was deeply congested, the conjunctiva slightly edematous, anterior chamber deep with greyish deposit at bottom, cornea hazy, pupil small, lens opaque, T + 2. V = light perception, no projection. The symptoms in this case were so violent that my first impression was that the eye had a beginning metastatic panophthalmitis, and the man was put on atropin, hot applications, inunctions of mercury and salicylat; and a corneal paracentesis was made twice a day for two days. At the end of this time all serious symptoms had disappeared, tension was normal, pupil moderately dilated, cornea and aqueous clear. It could now be seen that all the cortex except a little in the center had disappeared leaving the brown nucleus low down in the posterior chamber. The projection was good and two months later, during which time the eye had been perfectly comfortable, I made a forceps extraction of the nucleus in the capsule which gave him vision of 20/70 with correction, at the first test. There were a number of fine opacities in the vitreous, but no signs of glaucoma.

Keeping in mind the common symptoms of the last two cases, i. e., old

cataract, a sudden onset of tension with inflammatory symptoms; grey deposit in the anterior chamber, disappearance of the latter and restoration of useful sight with or without operation, I think it is fair to assume that a similar sequence has occurred in many if not all of the cases in which the combination of glaucoma with cataract cortex absorption has been observed. In some cases the absorption of the cortex seems to produce no increased tension. In many of these, however, where the cortex is absorbed or discharged into the anterior chamber a little at a time, it is probable that a transient increase of tension occurs but attracts no notice on account of the blindness from the cataract and the lack of pain. When the cortex escapes into the anterior chamber in any quantity, it seems to excite a decided chemotaxis, and where with irido-cyclitic symptoms, any of this cortex is seen in the chamber, it is natural to take it for inflammatory exudate. Whether the increased tension is due to direct blocking of the outlets by the cortex or is the result of the chemotaxis, or both, it is very difficult to decide; but I think there can be no doubt that the impression which some authors have gained that the spontaneous absorption of cataract is due to the occurrence of irido-cyclitis is based upon a misinterpretation of the congestive symptoms which accompany the absorption of the cortex, and is as erroneous as the belief that the absorption depends upon the occurrence of glaucoma.*

The foregoing facts and conclusions may throw some light on the somewhat mysterious loss of sight which is said to occur in so many eyes in which the lens has been couched. The report is that such eyes nearly always go blind from irido-cyclitis or glaucoma even when they are operated aseptically; and it seems to me much more reasonable to suppose that these results instead of being due to the bouncing about of the lens upon the ciliary processes are due to the chemotaxis or the increased tension which the absorption of cataractous lens matter apparently produces.

An interesting question is: What is the subsequent fate of eyes that have successfully passed the first danger of glaucoma from the spontaneous cure of cataract. We know that they are open to the danger of glaucoma from dislocation of the loose nucleus into the anterior chamber as shown in Case I; but there is also a question as to whether some harm may not result from the gradual breaking down and absorption of the nucleus. I have seen two cases of men about forty years of age with a hard nucleus in the anterior chamber, where there have been periodic attacks of intense pain, congestion and increased tension, with such complete absence of any trouble in the interim, that I have obtained the impression that these attacks were due to the sudden breaking down of the outer shell of the nucleus which, in the quiet periods, has been slowly prepared for the change.

It will doubtless be asked, why if hypermature cataracts are capable of causing such effects, we do not see more of the same sort of thing after the needling of soft cataracts; for after the initial glaucoma due to swelling of the lens and the release of debris which so frequently follow the first needling, the further process of absorption proceeds uneventfully. To explain this difference we must, for the present, appeal to the mechanical and chemical peculiarities of the hypermature cataract of adults. It may be the process is akin to the glaucoma which accompanies essential atrophy of the iris, i. e., the glaucoma in the latter class of cases may be due to the products of iris disintegration.

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* Since the above was written I have noticed the report by Schwenk in Oph. Record, Sept. 1917, p. 465, of a case of glaucoma from what he calls hyperreactive cataract. He has seen two other cases of the same sort and his views as to the production of glaucoma and inflammatory symptoms by a disintegrating senile cataract correspond entirely with my own.

CONCLUSION.

The occurrence of glaucoma coincident with the absorption of hypermature cataract cortex in eyes otherwise healthy, together with the long continued absence of glaucoma from the fellow eye, makes it probable that the glaucoma which has been observed in connection with the spontaneous absorption of senile cataract is the effect, not the cause of such absorption. It follows that a senile cataract should be kept under observation and operated before it becomes too hypermature, even if the other eye still has good sight.

DISCUSSION.

Marcus Feingold, New Orleans, said: About seven years ago I reported three similar cases, the report not being printed through my own fault. The picture was very much alike in all three instances, that of an acute attack of glaucoma; but the eyes showed deep anterior chambers. The aqueous was cloudy in all, and in one instance even a small hypopyon was present. The iris was discolored in all and tremulous in two cases. This, together with the milky, uniform capacity of the lens and the marked increased tension, helped in making the diagnosis. Speedy relief was had in all three cases by the extraction of the overripe cataract with resulting good vision. At the time of my report search of text- and handbooks failed to reveal any warning not to allow a cataract to become overripe, because it might result in an attack of glaucoma. As to the cause, irritation of the ciliary body by the subluxated, because shrunken, lens seems to be the only plausible explanation.

Edward Jackson, Denver, said that last year he had seen a case in a woman who had suffered from double cataract sixteen years before. One eye had been operated upon, the other left to nature. He saw her two months before her attack of glaucoma. In the eye which had not been operated he found the iris tremulous and a Morgagnian cataract. She was given her correction for this eye with the hypermature cataract. But she came back in two months with an elevated tension. Miotics were of very little value. Atropin was very much better. She had a distinct irido-cyclitis.

Melville Black, Denver, said this danger of setting up glaucoma might point to the operative indications in such cases. He had seen three cases in which the second eye became cataractous later, with a good result in the first or operated eye. We should operate both eyes, he believed, and not let the second eye alone. Thus we could avoid letting the patient have a Morgagnian cataract with the evil consequences of a secondary glaucoma.

Harold Gifford (closing): We should watch these cases very carefully. We should operate the first eye, unless the patient is willing to take the responsibility of being sure that the second eye will last as long as he lives. Dr. Jackson's case developed glaucoma suddenly. Dr. Gifford believed that degeneration of the cortex did not necessarily produce the glaucoma. On the other hand, he could not agree with Dr. Feingold regarding the importance of traction on the ciliary body in producing the glaucoma. In one of Dr. Gifford's cases, the anterior chamber was deep and the iris pushed back. The nucleus was not causing any trouble. He did not believe the nucleus irritated the ciliary body, but he did believe that the toxicity of the lens cortex was a bigger factor. He expressed the opinion that the theory as to traction upon or irritation of the ciliary body had always sounded rather "fishy" to him in these cases. The pain comes on very suddenly and the eye is very red. A paracentesis gives relief quickly. He believed that the cortex probably undergoes degeneration and the toxic products absorbed from the lens produce the glaucoma.

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2. Reuss, ibid., Feb. 1900, 39.
3. Verrey, abst. in Annals of Oph., Oct. 1916, 802.
4. Gifford, American Journal of Oph., Oct. 1900.

INJURY TO THE EYES FROM LIGHTNING STROKE.

WM. CAMPBELL POSEY, M. D.

PHILADELPHIA, PA.

A clinical paper including reports of two cases. Read before the Ophthalmological Section of the College of Physicians of Philadelphia, November 15, 1917.

In the latter part of July of this year, J. P., aged 14 years, was struck by lightning while he was leaning against the fireplace of a cabin in a boys' camp in Maine. The fact that the fireplace was provided with an iron stack was thought to have something to do with drawing the lightning, as the cabin was in the heart of a dense woods and surrounded by high trees. The lad was thrown to the ground by the violence of the stroke and rendered unconscious. The right eye was burned and the hair on that side of his face singed. About 48 hours after the injury, after he had recovered somewhat from the stroke, he was taken to Portland, Me., where he was seen by Dr. James A. Spalding, to whom I am indebted for the following notes:

"You will be much interested in the extraordinary case of J. P., who brings you this. He was struck by lightning July 21, and I saw him early on the 24th. The upper lid was much swollen and chemotic, the conjunctiva very much congested, and the pupil pinhead in size and vertically oval. The eye was so sensitive to light that vision could not be accurately tested. I dilated the pupil sufficiently with cocain to get a view of the fundus. There was a very faint scratch on posterior capsule of lens, media otherwise clear, and covering the entire field of observation was that milky white retinal exudate mentioned in the books as indicative of retinal concussion. I saw no detachment or hemorrhages and the visual field seemed normal in all directions. I gave him continuous hot packs for the swelling of the lid and a 1/5 per cent solution of atropin to keep down any possible iritis, as well as to enlarge the pupil in case anything should happen to the lens tissue. The case went on uninterrupted under this treatment, though the single stria or scratch on posterior capsule of lens gradually increased to two and then to six and then became invisible as the substance in front became opaque. The striae ran diagonally and looked like the markings of a fine-tooth comb, or claw scratches, or delicate wrinkles.

"I gave him Crookes' lenses properly cylindrified as by your pattern, and he has progressed favorably and can now use the good eye comfortably. I let him read a little after six weeks, and swim in a pool, the house physician seeing that the water was as free from germs as possible. This sort of enjoyment of life with a little exercise and a little reading has pulled him up physically very nicely. But in spite of any treatment the lens substance has gradually become more and more cataractous and the question now arises what to do. I should continue the atropin and watch what happens. Personally, I should operate on such an eye when it became quiet and imbibition had ceased. I cannot imagine that the lens substance would absorb of itself, but if it did not, then I would get rid of it by operation. He is young, and the lens substance is probably milky and would exude nicely without inflammatory results and with a small incision. It might even be removed by suction, which on the whole looks to be the best way."

The lad returned to his home in September, and I saw him shortly afterward, on the 21st day of that month. The eye was now quiet, but all view of the fundus was obscured by a fully developed cataract, the lens being uniformly opaque, the physiologic sectors being plainly outlined except below where they were obscured by the

capsule, which in this position appeared thickened and opaque. The pupil was of normal size and the iris reacted freely to light. Light projection and perception were good in all parts of the field of vision. The left eye was unaffected. A weak solution of atropin was prescribed for the cataractous eye and the patient counseled to avoid undue strain upon the left eye and too much exposure to light. Yesterday, four months having elapsed since the accident, and no signs of irritation having arisen during the two months that have passed since he has been under my observation, I performed a cautious needling upon the cataractous eye.

CASE II.

On June 21, 1911, H. A., 24 years of age, while looking out of a second-story window, the sash of which was raised during a thunderstorm, was suddenly blinded by a flash of lightning which struck in the yard not far from where he stood. A curious tingling ran through his body and for a short time all was black before his eyes. In about a quarter of an hour, however, his vision cleared somewhat and he was able to discern the movements of his hand when held several inches from his eyes. After examination and a brief residence (2 hours) in the Hahnemann Hospital, he was moved to his home in Atlantic City, his vision alternating between spells of blindness and the ability to distinguish hand movements. When seen by Dr. O. D. Stickney, of Atlantic City (16 hours after the accident), he complained of a heavy uncomfortable feeling in the back of the head, of smarting and burning in the eyes and of lacrimation. The eyes were examined with difficulty on account of marked blepharospasm, but beyond a slight injection of the conjunctiva and a marked contraction of the pupils, nothing abnormal was noticed externally, the irides reacting promptly to light stimuli. Vision equaled the recognition of hand movements at a few inches in front of the eyes. On account of the blepharospasm and the small size of the pupils, ophthalmoscopic examination was unsatisfactory, but the media appeared clear and the heads of the optic nerves normal.

Cerebration was somewhat obtunded and the patient swayed to and fro if unsupported. There were distinct choreiform movements of the left arm and hand.

The patient was confined to bed. Cold compresses and boracic acid solutions were applied to the eyes and atropin instilled twice daily, bromid ordered and light excluded from the room. I saw the case in consultation a few days later (6/24/11). Cerebration had now cleared and the choreiform movements previously noted in the left upper extremity had disappeared. Vision in the right eye was limited to light perception, that of the left, counting fingers held immediately in front of the eye. As the blepharospasm had now cleared away, and the pupils were widely dilated by the mydriatic, the fundus could be carefully studied, and a diffuse haze and edema of both retinas discerned without difficulty. The margins of both optic nerves were slightly obscured and both papillae were hyperemic. There were no hemorrhages or extravasations and both lenses were clear. The treatment inaugurated by Dr. Stickney was continued, and 1/60 of a grain of strychnia administered three times daily. From Dr. Stickney's notes, which he has kindly placed at my disposal, I find that the haze and swelling of the retina slowly declined and vision steadily improved. On 7/7/11 fingers were counted at 12 feet with the right eye and 8 feet with the left. Colors could be differentiated and the patient appeared to have entirely recovered from the mental shock occasioned by the lightning stroke. On 7/28/11 vision was normal in each eye and the field of vision unrestricted. The subsequent course of the case has been uneventful, the patient being able to continue his business without ocular or general symptoms.

REMARKS.

Injuries to the eyes following lightning stroke are uncommon, though the

literature contains approximately a half hundred cases. The majority of the reporters cite some disturbance to the lens in nearly all of the cases, the changes in the structure ranging from localized opacities which remained stationary for years after the accident, to fully developed cataracts, which required various durations of time for their formation, the complete haze of the lens appearing in some instances within a few weeks; in others, several weeks elapsing before complete opacification occurred. The majority of the cases seem to have been in young individuals, the reason for which is not quite apparent.

As might be expected, a number of theories have been adduced to explain the development of cataract after lightning stroke, and a number of master minds in ophthalmology have been engaged in its elucidation. In 1882, Leber, who reported in that year a case of binocular cataract after lightning flash, concluded from a study of this case and from the others which had appeared in the literature up to that time, that the changes in the lens were due to direct physico-chemical action of the electricity upon the lens substance; in other words, to a catalytic action of the electricity, in consequence of which there occurred a coagulation of the albumin of the lens.

Yvert and others suggested that a rupture of the capsule determined the later haze of the lens, but this has never been substantiated by clinical or microscopic proof.

In 1886, Knies assumed that the lenticular haze was due to a direct burn of the lens in consequence of the high temperature and of the physicoelectric influence of the flash upon the nervous tissues. He thought also that there was a similar action upon the contractile elements of the muscles and blood vessels, all other changes, such as will be referred to presently, being secondary.

Hess, however, has probably deduced the proper theory of the lens changes in this class of cases, and those who are interested will do well to read an account of the experimental work which he performed on the eyes of rabbits subjected to artificial lightning stroke, which is fully reported in this classis chapter on the lens in the 2nd Edition of the Graefe-Saemisch Handbuch. It will suffice at this time to quote his conclusions, admirably abbreviated and expressed by Fuchs in the last American Edition, and also evidently subscribed to by this eminent authority, "The opacities of the lens and atrophy of the optic nerves. . . . (which occur after lightning) are produced not like the external injuries by the action of heat, but by the power possessed by the electric discharge to kill living cells even without the development of heat." Hess has proved this for the lens, showing that by electric shocks the epithelium of the lens capsule is made to die, the result being a clouding of the lens.

In addition to the changes in the lens, injury to the optic nerve is not uncommon in this class of cases and Stillson in an excellent article entitled "Cataracts Produced by Shocks from the Commercial Electric Current," which appeared in Northwest Medicine in February, 1907, has catalogued a number of such instances. Thus, "neuritis and optic atrophy were reported by Leber, Pagenstecher, Laker and Vossius; anemia of the optic nerve by Uhle; rupture of the choroid and detachment of the retina by Reich; hemorrhage or infiltrates of some kind in the region of the macula and the pupil by Downar, Reich and Laker; ptosis by Sämisch, Power, Pagenstecher, Knies, Uhle and Nagel; opacities of the cornea by Vossius, Knies and Silex; soreness in the extrinsic muscles by Sämisch; mydriasis by Henrotay and Uhle; myosis by Pagenstecher and Laker; paresis of accommodation by Uhle and Nagel; iritis by Knies; iridocyclitis by Vossius; photophobia by Maclean, Purtscher, Vossius, Meyhofer, Silex and Nagel."

As to the systemic symptoms in these cases, Stillson added the following: Burns of the first and second degree, paresis of the extremities, hemiplegia, anesthesia, aphasia, anuria.

In the presence of such complications the prognosis for the restoration of vision by operation in cataract after lightning flash must necessarily be guarded. Naturally no procedure should be essayed without the assurance of a satisfactory field of vision, and the probability of a healthy fundus. Light fields are, however, misleading, and it would appear wiser to defer a definite opinion as to the future usefulness of the organ until the lenticular haze has been entirely removed and a view of the fundus thereby obtained. One fact appears certain, that no form of operation should be attempted until every trace of ciliary irritation has subsided. A cautious needling appears to me to be the operation of choice and to be preferred to any form of procedure which aims at the complete evacuation of the opaque matter at one sitting.

MEMBRANOUS CONJUNCTIVITIS OF OVER FOUR YEARS' DURATION.

H. H. STARK. M. D.

EL PASO, TEXAS.

Report of a case in which the conjunctival condition was associated with skin disease, probably erythema multiforme. Cure under solution of quinin sulphat. Read before the Third Colorado Ophthalmological Congress, August 10th, 1917, with discussion.

In a review of the literature, we find that the term "membranous conjunctivitis" has been in use for many years. However, as our knowledge of bacteriology has increased it has become a less comprehensive term, describing as it does a condition rather than a definite pathologic process.

The condition may be due to infection by many of our well-known microorganisms, such as diphtheria bacilli, streptococci, etc., to chemical agents such as nitrat of silver and other caustics, or to trauma of the mucous membrane, illustrated in many instances by the exudate following an operation on the conjunctiva.

Some authors divide the condition into two forms, basing the division on the general appearance rather than etiology. The term croupous is applied to those cases having a small amount of membrane, slight swelling, no invasion of the lid, where healing leaves no scar; diphtheritic to those cases where there is a large amount of exudate, marked swelling, deep involvment of the lids, with scarring.

It is a generally accepted fact that this division means very little as to etiology, since there may be a very slight involvement with the most virulent infection, while the severe form may be caused by a type of infection which is ordinarily mild. Some authors term all forms "pseudomembranous."

It might be better to drop the term membranous altogether, and speak of the type of infection or cause of the condition, were there not cases which cannot be classified in any other way, and it is such a case that I have to report. This case, to me, has an interest from the standpoint of the obscure etiology, the long duration and the method of cure.

CASE.

E. K., female, age 11 years, came under my care on September 18, 1909, with the following history: Father, mother, and three sisters living, all in good health; normal birth, but had never been considered a strong child, the condition being ascribed to chronic tonsillitis rather than to any definite disease. At the age of four and a half years, was infected by poison ivy, the eruption lasting for a number of days, finally disappearing. At the age of six

years, she had a tonsillectomy performed by a competent surgeon, with good results. Two months later she developed diphtheria, which responded to one injection of antitoxin, the child making a good recovery and was well for two months, when she developed a slight fever with an eruption resembling measles. The eruption, with low grade fever, continued for three weeks, when large oval blebs, with thick covering and filled with serum, began to form on top of the previous eruption, increasing in number over the body, and finally, at the end of four weeks, appearing on the face.

At this time, the eyes, mouth and throat became involved. The disease apparently responded to no form of treatment, the blebs being opened with scissors and the serum allowed to escape. At the end of seven weeks the condition began to improve on the body, finally healing, leaving no scars, but for a number of months spots could be noticed at the time of taking a warm bath.

During the attack the lids were much swollen, with a discharge of pus from the eyes. On the mouth and throat there were large whitish spots, undoubtedly broken down eruptions. The eyes were the last to heal. Finally after several weeks treatment, the improvement came to a standstill, leaving the eyes red and weak and the inside of the lids whitish in appearance. The mother said the eyes had been treated for a long time, with medicine answering the description of nitrat of silver and copper sulphat—with apparently slight improvement. During the later part of the treatment, there was no change, and as the treatment was decidedly painful it had been stopped.

The condition then shown had been present for over four years.

Examination showed the vision in each eye to be two or three letters in the 20/20 line, slight entropium of all lids, many cilia missing. Each lower lid, when everted, showed a whitish coating, very faintly gray, on the tarsal conjunctiva only, no other part of the eye being affected. With a cotton applicator, this coat could be removed, coming off as a distinct membrane, at times in very large pieces, leaving a smooth, red surface covered with lines of cicatricial tissue, but no bleeding or granulations. This coating was removed several times, each time reforming within twenty-four hours. The line of cicatrices ran parallel with the lid margin, and in each eye a band was attached to the point near the inner canthus, which became more pronounced with forcible eversion of the lids. The upper lids were stiff and rather hard to evert, showed considerable scar tissue but no membrane. The right cornea showed slight nebulae in several spots; the left showed lower one-fourth to be decidedly cloudy, with a number of superficial vessels. The pupil reaction was normal. Both pupils dilated evenly, showing no synechia. No fundus change was found.

Laboratory examination of the membrane showed xerosis bacilli and fibrin.

I found that the case had excited considerable attention among the medical profession at the time of the attack, and that many physicians had been called in consultation. In personal conversation with two of them, I found that the diagnosis had varied from measles, scarlet fever, ivy poison, to some undiagnosed skin disease. As no dermatologist saw the case, a definite diagnosis had not been made.

In considering the etiology, I think that exanthemata may be excluded. Two causes must be considered: (1) Rhus poison, as the child gave a history of having at one time been sensitized, but the general history of the case in no way resembles any ivy poison that I have ever seen; (2) anaphylaxis following diphtheria antitoxin. As one dose only was given in this case, it is doubtful whether it could have been the cause, the rash appearing two months after injection—and it is decidedly unusual to find a reaction coming much after fifteen days, at most one month after the injection.

In considering the skin diseases I find that we have probably four pressenting bullae; dermatitis herpetiformis, impetigo contagiosa, pemphigus, and erythema multiforme. Of these,

I think the first two can be excluded in considering this case; dermatitis herpetiformis, by the absence of severe itching and by the eruptions in this disease usually appearing in groups and of irregular shapes; also impetigo contagiosa, because the walls of the bullae are extremely thin and easily broken, and because of its contagious nature. Neither of the two above conditions appears on the mucous membrance of the mouth and throat. Pemphigus is by far the most common disease of this type to attack the eyes, but I believe this also can be excluded, from the fact that the bullae develop from a healthy surface; the attack is usually very severe; the history of the case is of long standing, lasting many times for years. Where the eyes are involved, there is a decided scarring, with the forming of symblepharon; the usually marked shrinking of the conjunctiva, the process usually going on to complete destruction. Erythema multiforme begins with a slight fever; the skin lesion may be of any type and change from one to the other as it did in this case, from a macular eruption into bullae. The wall of the bleb is fairly thick, with na tendency to rupture; it frequently attacks the mucous membrane of the mouth and throat, and there is a history of complete recovery.

It is my belief that the last named disease is the primary cause of the condition in this case. However, this affection is not common, as in looking over the Year Books of Ophthalmology, from 1904 to 1916, I find only two cases were reported of membranous conjunctivitis due to erythema multiforme, these being reported by Salus in 1912.

In considering the therapy of the case I found that the caustics were contraindicated, owing to the fact that they might at times produce practically the same condition, also that they had been tried in this case with no appreciable result.

In consulting the American textbooks, I was not impressed with any of the remedies offered. I found that two English authors, Nettleship and Parsons, recommended the solution of quinin sulphat locally in membranous conjunctivitis. So I decided to try this preparation, which is made by dissolving three or four grains of quinin sulphat in the smallest amount of dilute sulphuric acid, U. S. P., that can be used, which is generally one drop of acid to a grain of the salt. To this is added sufficient water to make an ounce. Several drops should be used in the eye daily.

The use of this remedy was commenced without removing the membrane, and there was a decidedly noticeable thinning of the exudate within ten days. It entirely disappeared from the right eye within four weeks, and from the left within six weeks, with the exception of a small thin spot about two by three millimeters in extent near the lid margin, which has persistently remained. There has been no return of the exudate up to the present time, eight years.

Just what effect the remedy might have had on the acute condition, I am unable to say, but it certainly acted promptly in the later stages of the disease, and has special significance at the present time, owing to the recent introduction of the new quinin-copper salt ethyl-hydro-cuprein, and I feel it should be given a trial in conditions other than in the case reported.

LITERATURE CONSULTED.

Ophthalmic Year Book, 1904 to 1916.
Roemer Textbook of Ophthalmology, Foster's translation, 1913.
Fox, Practical Treatise on Ophthalmology, 1910.
de Schweinitz, Disease of the Eye, 7th Edition.
Fuch's Textbook of Ophthalmology, 4th Edition.
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Parsons' Diseases of the Eye, 1907.
Schamberg, Diseases of the Skin and Eruptive Fever, 3rd edition.

DISCUSSION.

Marcus Feingold, New Orleans. It is unfortunate that in the case reported the skin condition was not seen by the dermatologist, though no reason exists to dispute the diagnosis of Dr. Stark. Yet it is possible that the eye condition may have had another interpretation. The following case is of interest in connection therewith. A young woman of low mentality, aged about 25 years, appeared at the Touro Infirmary Out-Patient Clinic with a chalazion on the left upper lid, telling that she had been taking some medicine and using a lid ointment prescribed by her physician. On everting the lower lid a white opaque area was found in the conjunctiva of the lower lid and fornix near the inner canthus. The suspicion at once arose that we were dealing with a burn of the conjunctiva occasioned by the use of mercury while the patient was taking iodid of potash. Acting upon this, only bland treatment was used, but the condition remained unchanged during the next few days, possibly the area getting somewhat smaller.

A few days later to our great surprise the opaque necrotic area appeared much larger, the balance of the conjunctiva, at the same time, being remarkably free from symptoms of inflammation. Soon a similar smaller spot was discovered in the other eye in the identical location. The former diagnosis was now abandoned and the strong suspicion of induced conjunctivitis arose. Pharyngeal reflex was found entirely absent and the neurologist reported the patient suffering from dementia praecox. During the next four or five weeks the condition remained practically unchanged but for some slight exacerbations and remissions first in one eye, then in the other one. Admitted to the hospital for observation and close watching, and without any local treatment, the conjunctiva returned to normal within a few days and remained so during the whole stay of six weeks in the hospital. In the case of Dr. Stark it is possible that the condition began as described; but that the child being made the center of attention in the family, may have kept up the irritation to maintain this interesting position.

Harold Gifford, Omaha, Nebraska. The fact that Dr. Stark's case extended to the upper tarsus would be against the idea of malingering.

H. H. Stark, El Paso, Texas. My experience of malingering is that the disturbance is more apt to be on the temporal than on the nasal side. I think it is absolutely impossible for malingering to have occurred in this case. Fuchs calls attention to the fact that the condition may exist over many years. The child is the daughter of our mayor, and her mother is a very intelligent woman. The child had not had any attention called to her eyes for four years, all treatment having been omitted.

Dr. Gifford asked whether Dr. Stark had tried staining with fluorescein after removing the membrane. Dr. Gifford had found fluorescein as useful in the conjunctiva and in the fornix as on the cornea.

H. H. Stark (closing). No. There were no granulations, but there might perhaps have been some staining.

CORNEO-SCLERAL TREPHINING.

C. A. Clapp, M. D., F. A. C. S.

BALTIMORE, MD.

A report of five cases subjected to this operation which resulted in as many disappointments.

While the operation of corneo-scleral trephining is theoretically ideal, and in many hands seems to elicit only the highest terms of commendation, in others, there have been noted subsequent complications which have caused disappointing end results. I think our experience has been unusual in that all cases operated upon have proven in the long run to be disappointing. While I say *all* cases and then show that this is only five in number, still there are certain features about some of them that make them of considerable interest. Some of the unsatisfactory conditions that have been reported are: Late infection, latent iritis, fulminating glaucoma, and hypotony with poor vision; all of which have occurred in this series of cases.

Following is a brief report of case histories with comments:

Case I.—W. S. Colored. Age 55. Presented himself October 7, 1912, with an acute glaucoma in his right eye following a blow upon the eye, left eye showed absolute glaucoma. Myotics failing to reduce tension, even in ab-

sence of light perception, it was decided to trephine. The operation was performed February 3, 1913, with a small iridectomy. Healing was uneventful, but the trephine opening seemed to fill with organized exudate, and tension to increase until March 3, 1913, when a tension of plus three, (fingers), was noted. No pain being experienced, nothing further was done, and the patient failed to report thereafter.

Case II.—P. R. Hebrew. Age 25. January 27, 1913, gave history of poor vision in left eye for one month, with pain for the past week. Examination shows deep anterior chamber, floating opacities in vitreous, myopic crescent about each nerve, left nerve decidedly cupped and pale.

Myotics ordered.

V= O.D — 16 = 15/40
O.S. — 14 = 15/40

Tension O.D. 15 mm.
O.S. 40 mm.

Tension remaining high; on February 13, trephining of left performed. There was only moderate reaction.

On February 26,

Tension O.D. 18 mm. Hg.
O.S. 18 mm. Hg.

On March 24,

Tension O.D. 30 mm. Hg.
O.S. 40 mm. Hg.

April 14, left pupil dilated. Tension 50 mm. Hg. Tension remained high even under myotics. V = in O.S. on January 28, 1914, was 2/200, nerve becoming more atrophic.

March 16, 1914, patient returned with a violent attack of acute conjunctivitis. March 18, 1914, the marked bleb over trephine opening had broken with flattening, and extensive fibro-purulent exudate filled anterior chamber. Under treatment in the hospital the eye cleared up so that on April 1, 1914, it showed clear anterior chamber, large floating opacities in vitreous, tension reduced, nerve white, and vision hardly more than fingers. We have been unable to get the patient to report for further examination.

Case III.—E. K. White, widow. Age 62. On March 3, 1913, gave history that left eye was operated on twelve years ago for failing vision without result. That vision in right eye has been failing for six months, and she has been using drops from a hospital for the same. Examination showed operative coloboma upward in left eye with absolute glaucoma. Right eye showed simple chronic glaucoma with pitting, but normal tension. Continuance of myotics ordered. Tension 20 mm. March 19, 1913, tension O.D. 50 mm. Blood pressure 220. Patient ordered stronger myotics and blood pressure treatment, tension still remained above 40 mm. Hg., and in view of the unsuccessful iridectomy on left eye trephining was advised for right, which was performed May 26, 1913, using 1½ mm. trephine. Eye did well for two days, when fulminating glaucoma developed and eye was lost, to absolute glaucoma.

Case IV.—M. O'N. White man of 56. July 19, 1913. Gave history that left eye had been failing for several years and right for six months. Had been under care of a recognized oculist. Examination showed simple chronic glaucoma in each eye with tension of O.D. 37 mm. Hg., O.S. 40 mm. Hg.

V= O.D. + 1.75 = 20/20
O.S. Fingers in temporal fields.

Patient was treated by eserin and pilocarpin until December 4, 1913, with no loss of vision and tension below 35 mm. Hg. Upon the advice of Colonel Elliot a bilateral corneo-scleral trephining was performed by the Colonel. There resulted very little reaction and tension soft.

On February 6, 1914, V = O.D. 20/100, O.S. Motion.

On May 4, 1914, tension was O.D. 13 mm. Hg., O.S. 13 mm. Hg.

March 24, 1915, V = O.D. 20/100, O.S. Motion.

May 20, 1917, patient returned with small areas of infiltration in upper part of right cornea. No change in vision.

Case V.—K. K. White, female, single. Age 37. July 3, 1913. History of failing vision in each eye for some time.

V = O.D. 15/200 2.25 = 15/40
O.S. 15/200 2.25 = 15/40

Diagnosis: Simple chronic glau-

coma with cupping and contracted fields, worse in right.

Tension O.D. 37 mm. Hg.
O.S. 37 mm. Hg.

Left field showed greater contraction and also less effect from myotics and so left eye was trephined on February 23, 1913.

March 10, 1914, tension finger normal with vision in O.S. of 20/50 plus.

April 8, 1914,

Tension O.D. 25 mm. Hg.
O.S. 9 mm. Hg.

Operation upon right eye was advised and thinking it gave a good opportunity to note the relative merits of trephining against iridectomy the older operation of iridectomy was performed on right eye May 12, 1914.

June 11, 1914, with correction,

V = O.D. 20/80
O.S. 20/30

On July 20, 1914, patient returned complaining of some pain in left eye, which showed some ciliary congestion. Patient did not report again until August 7, 1914, when well-marked case of iritis was present in left and atropin ordered.

March 10, 1914,

Tension O.D. 20 mm. Hg. with al-
O.S. 17 mm. Hg.

most complete posterior synechia and beginning opacity in lens of left eye. Atropin viii gr. ordered. March 29, 1915, left lens completely opaque.

July 20, 1915, removed lens by incision above, slight loss of vitreous. Cornea started to become opaque from above and has continued until most of tissue is opaque and vision of light perception only remaining.

April 16, 1917,

V = O.D. with correction 20/100++
O.S. Light perception.

July 19, 1917, left cornea steamy. Tension plus. Enucleation advised.

COMMENTS.

Case I. This was our first experience with the operation of trephining and not a very favorable case. The operation was performed to see if the tension would remain lowered without expecting restoration of vision. But neither was there permanent lowering of tension nor restoration of vision.

Case II. This case showed satisfactory lowering of tension for the first month; but it did not remain permanent even with the presence of a patent opening, with marked bleb over opening; and later showed a typical late infection, just about one year after the primary operation. Although the anterior chamber infection cleared up the vision was not restored.

Case III. This case one would have thought to have presented proper indications for the corneo-scleral operation, as iridectomy had failed on the left, and myotics failed to keep tension down in the right. Later writings and our own experience tend to make us think we erred in using the smaller trephine, although we believe that this represents one of those fulminating cases where all procedures are without results.

Case IV. The first three cases did not have the same skill in execution that this case had and yet the filtering scars were all present and could be demonstrated by pitting. This case had a vision of 20/20 in the O. D. and the tension was kept down with myotics prior to operation. Since operation there has been even hypotension but the vision has never been better than 20/100. Would not this case have done better under prolonged myotics? Does not the beginning corneal infiltration result from the hypotension? Certainly we can find no fault with the operative technic.

Case V. This case probably presents better conditions for our experimental control than any of the others. The Elliot operation was performed on the better seeing eye. The filtering scar and resulting hypotension were perfectly satisfactory; and yet a latent iritis developed five months after the operation with subsequent blindness; while the old classic van Graefe iridectomy on the worse eye, still retains useful vision and satisfactory tension.

CONCLUSIONS: First — The corneo-

FIG. 1, CASE I.—NOTE POSITION OF TUMOR, AND LACK OF PIGMENT IN ANTERIOR THIRD.

FIG. 2, CASE I.—ANTERIOR SURFACE OF IRIS, POSTERIOR SURFACE OF CORNEA AND ANGLE OF ANTERIOR CHAMBER COVERED WITH TUMOR CELLS.

FIG. 3, CASE I.—ECTROPION OF PIGMENT LAYER OF IRIS.

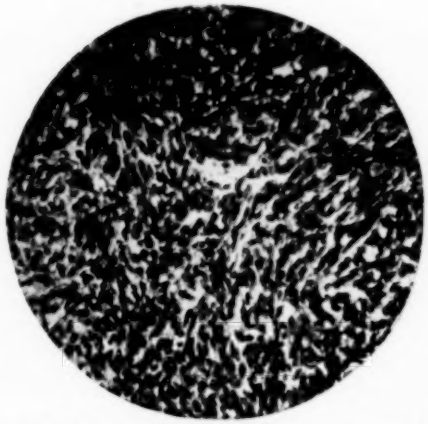

FIG. 4, CASE I.—AREA FROM UNPIGMENTED EPIBULBAR PORTION OF TUMOR.

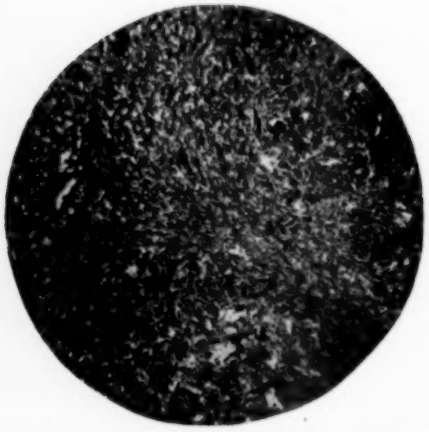

FIG. 5, CASE II.—SECTION FROM METASTATIC NODULE IN LIVER.

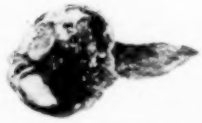

FIG 6 CASE III.—GROSS SPECIMEN NOTE TUMOR ON OPTIC STALK.

MELANOBLASTOMA OF THE EYE

FORMAN AND HUGGER.

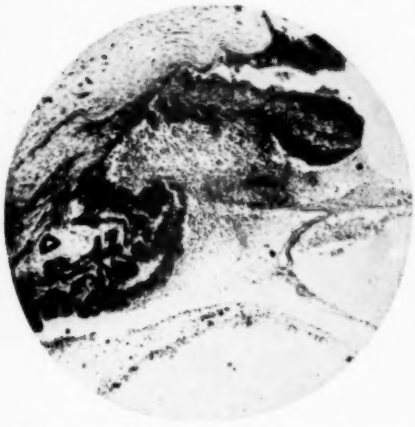

FIG. 7, CASE III.—IRIS BOUND TO CILIARY BODY BY GRANULATION TISSUE.

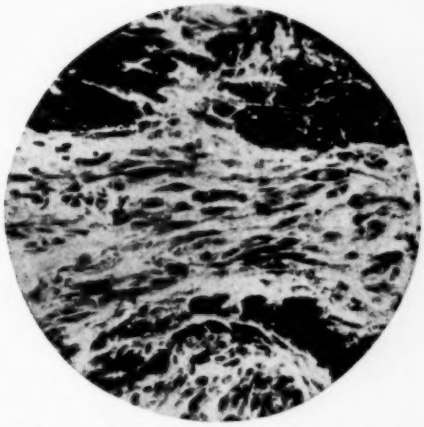

FIG. 8, CASE III.—TUMOR IN OPTIC NERVE. INFILTRATING SPINDLE CELLS CONTAINING PIGMENT, SUPPORTED BY TISSUE OF THE PART.

FIG. 9.—TUMOR IN POSTERIOR PART OF CILIARY BODY.

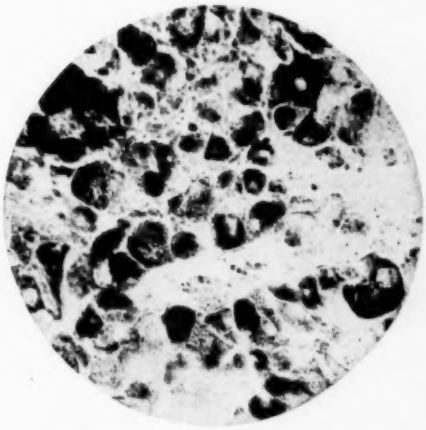

FIG. 10, CASE IV.—VARIATIONS IN SIZE AND SHAPE OF CELLS.

FIG. 11.—TUMOR CELLS WITH NET-WORK OF TISSUE CELLS INTERSPERSED.

MELANOBLASTOMA OF THE EYE.

FORMAN AND HUGGER.

scleral trephine operation for glaucoma has late results which may develop even years after the operation.

Second—That rarely if ever should it be the operation of choice.

Third—That it should be tried where iridectomy has failed.

Fourth—Some reports in cases of buphthalmos would seem to warrant further trial in this condition.

MELANOBLASTOMAS OF THE EYE.

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Studies from the Laboratory of Pathology of the Ohio State University. Supplemented by clinical notes regarding the four cases reported; and reasons for preferring the term melanoblastoma to the more commonly used sarcoma of the uveal tract.

Tumors of the choroid may be either primary or secondary in origin. Primary growths are the more frequent and the large majority of these are composed of pigment producing cells.

The pigment bearing choroidal tumors are usually referred to as melanosarcomas. In this region pigment-free tumors are sometimes observed which differ in no wise either in structure or clinical course from those which contain pigment. Such tumors have been collected by Schieck[1] under the term leucosarcoma. This would appear to be an unfortunate term, because it is used by Sternberg and others to designate those cases in which a definite tumor-like mass is developed in some organ or tissue; and is composed of *lymphoid* cells which seem to escape into the blood stream, giving rise to leukemic alterations of the blood. Ribbert designated both the pigmented and the pigment-free tumors of this group as *chromatophoromas*. Mallory adopted the more euphonious and equally comprehensive term of *melanoblastoma*. The use of a group name for all tumors composed of melanoblasts, or chromatophores, has the advantage of not placing any emphasis upon benign or malignant forms. This compels a more careful study and accurate evaluation of the individual tumor.

Marshall[2] in his collection of 134 cases of melanosarcoma of the eye, found that the age ranged from 15 to 90 years with an average age incidence of 50 years. One eye, as a rule, is affected. The cases on record appear to be about equally divided between the left and the right eye. Injury is considered as an important etiologic factor by some authors. Marshall found a definite history of injury in about ten per cent of his series. Among the fifty-five eye specimens in the Museum of Pathology at the Ohio State University, there are four cases of melanoblastomas arising in the eye.

CASES.

Case I. *Clinical Notes:* A white woman, aged 30, consulted an ophthalmologist on October 8, 1914, because of pain and loss of vision in the right eye. Upon the appearance of a dark area on the upper surface of the globe of this eye about three years before, the vision of the patient began to decline. This area increased in size, bulged slightly, and was attended by an excruciating pain throughout the entire period. The patient recalled rather indefinitely having received an injury to the right frontal regin. Ophthalmoscopic examination of the right eye revealed a normal fundus reflex. The details of the fundus were imperfect. There was a marked cupping of the disc. This was verified by the indirect method.

Removal was advised and the eye was enucleated October 9th, 1914, under ether anesthesia. The patient made an

uneventful recovery and left the hospital on the 15th of October. In June, 1916, the patient died with the symptoms of a generalized sarcomatosis. No autopsy, however, was permitted.

Pathologic Notes: Upon gross examination the eye is spherical and presents a diameter of 2.5 cm. The cornea is clear and apparently normal. On the upper surface of the eye extending from the sclero-corneal junction back to the equator and measuring 1.5 x 1 cm. is a blackish area. At the equator, this gradually blends into the sclera.

Upon section, the blackish area is revealed as the outer surface of a tumor mass occupying the ciliary body and the anterior portions of the choroid and sclera. The anterior one-third of the tumor mass does not contain pigment while the remainder is a dark brown.

Upon microscopic examination, sections from the side of the tumor present an iris which is decidedly shortened. The pigment coat has curved over onto the anterior surface of the iris in the process of shortening, forming in this way a fish hook figure. The muscle of the ciliary body is destroyed and replaced by tumor cells. The tumor cells are spindle shaped associated with a varying amount of pigment. In the tumor mass just posterior to the ciliary region, the tumor cells are so deeply pigmented that their nuclei are hidden and the outline of the cell is obscured. In the ciliary body, the tumor cells are spindle shaped and present but little pigment. The tumor begins at the equator and extending forward, at a point opposite the ciliary body it passes on either side of the sclera leaving it free from invasion. Over the outer surface of the sclera, the tumor mass extends for a distance of 2 mm.

To summarize, the tumor is a malignant melanoblastoma taking its origin in the choroid coat of the right eye. This tumor came to operation because of the pain associated with it.

Case II. *Clinical Notes:* A white man aged 34 years consulted his family physician about two years before his death because of a "bulging of the left eye." The physician made a diagnosis of malignancy, and referred the case to an ophthalmologic surgeon who removed the eye. The patient made an uneventful recovery and remained well until May, 1916, when he noticed an enlargement of the abdomen and weakness upon exertion. He again consulted his physician and was referred to a general surgeon who viewed the case as hopeless and refused to operate. He grew rapidly worse and died on the 18th of July, 1916.

Pathologic Notes (abst.): The autopsy revealed a liver about twice its normal size. This enlargement was due to the presence of pigmented tumor nodules. Since the autopsy was complete and no other possible origin for the primary growth was found, it seems reasonable to conclude that the tumor of the eye was the primary growth, even though no pathologic study of that eye is available.

Microscopic examination of the liver reveals tumor nodules composed of cells varying in shape, size, and the amount of pigmentation. These cells are supported by a rather liberal amount of stroma. In some of the larger nodules, this is quite marked, so that nests of the tumor cells appear to be buried in a dense connective tissue, giving an alveolar arrangement to the tumor. Here the tumor cells tend to be spherical in shape and have only a small amount of pigment associated with them. In the smaller and more isolated nodules the tumor cells are of a spindle shape and have produced much more pigment.

To summarize, there is a melanoblastoma involving the liver. The eye had been removed on account of a tumor. Although we did not have the opportunity of studying the specimen from the eye, it seems certain that this tumor was the primary growth, since the autopsy eliminated other possible points of origin. This case is similar to that recorded by Adams[3] and others. The liver is a favorite seat of metastases.

The following two cases have been in the museum for some years and lack

both histories and pathologic notes. The descriptions are made entirely from the specimens of one-half of each eye and from the celloidin blocks and microscopic sections. Both specimens have been cut to supply the teaching loan collection of the laboratory[4] so that many microscopic sections are available for study.

Case III. The eye, after fixation, presents an antero-posterior diameter and a vertical diameter of 2 cm. each. The external examination reveals nothing worthy of note except the presence of a nodular ovoid swelling about 1 cm. in diameter and extending along the optic nerve for a distance of 1.5 cm.

The sectional view presents an apparently normal cornea. The aqueous chamber is filled with a mass of greyish material, which extends to and covers the anterior surface of the lens immeshing the iris and ciliary body. The lens is normal in appearance. The sclera is not remarkable. In the vitreous cavity on the one side, there is a mass similar in appearance to the one seen in the aqueous chamber. This extends from the ciliary body to slightly behind the equator. On the other side, the choroid coat is apparently thickened to 3 mm. This thickening extends around and across the fundus to within 1 cm. of the greyish mass on the opposite side.

Microscopic examination reveals the mass in the aqueous chamber to be a fibrinous exudation. The lens is not remarkable. The iris is composed of dense connective tissue and a few blood vessels and is decidedly shortened and thickened. The pigment layer has been drawn over the anterior portion of the iris. The posterior surface of the iris is intimately attached to the ciliary body and its processes by granulation tissue. This granulation tissue contains pigmented cells from the iris. The ciliary body is flattened against the sclerotic coat. The greyish mass in the vitreous cavity is also a fibrinous exudation. The retina has been dislocated by the exudation. The choroid is normal until the equator is reached, when it graudally broadens out into the tumor mass. This mass involves the other coats of the eye in the region of the optic nerve. It passes into the optic nerve head and extends on inward forming the tumor nodule seen on the optic stalk. This tumor is composed of spindle shaped pigmented cells, supported by the tissue cells of the part. It presents the typical picture of an infiltrating sarcoma plus pigmentation.

To summarize, this is a typical specimen of melanoblastoma arising in the choroid and invading the optic nerve.

Case IV. Eye of a white male American. Clinical Diagnosis: Melanosarcoma of the eye.

Pathologic Notes: Since the eye presents nothing noteworthy, except the tumor, which is a small circumscribed nodule, the description will be confined to the tumor. It is a brownish mass, measuring (after fixation) 4 mm. in diameter. It appears to take its origin in and projects from the posterior portion of the ciliary body.

Microscopic examination shows that the posterior portion of the ciliary muscle has been displaced inward and forward. The ciliary processes and the iris are normal in structure, but are displaced forward so that the angle of the anterior chamber is acute but not obliterated. The tumor mass is circumscribed. It is covered by a thin layer of uveal pigmented cells and one of the cells of the pars ciliaris retinae. The tumor cells vary greatly in size and are round or polyhedral in shape. They all contain granules of brownish black pigment. Interspersed between the tumor cells is a scant network of the cells of the part. In certain of the sections, the pigmented cells of the tumor are continuous posteriorly with those of the choroid.

To summarize, this tumor is a small, fairly definitely circumscribed but not encapsulated melanoblastoma arising in the choroid coat.

Four specimens of malignant melanoblastomas arising in the choroid are here recorded. Most cases show a gradual loss of vision with the progressive involvement of the eye by the growing tumor. Fortunately these four speci-

mens illustrate in detail the four arbitrary stages of the disease mentioned by Adams[3] and Alter,[5] viz.:

1. Case 4 presents a comparatively small tumor which has not involved the eye to any great extent.

2. Case 1 presents a larger tumor coming to operation because of the pain.

3. Case 3 presents an excellent example of extraocular involvement in which the tumors have grown into the optic stalk.

4. Case 2 is a study of the liver in an instance of melanosarcoma. These tumors frequently metastasize from the eye to the liver and to the lungs.

In conclusion the authors wish to acknowledge their indebtendness to Drs. C. F. Clark, Ivor G. Clark, Arthur M. Schaeffer, and H. R. Wright for the use of the material upon which this study is based.

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THE ROLE OF THE DUCTLESS GLANDS IN OPHTHALMOLOGY

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A general review of the subject with three illustrative cases. Read before the Third Colorado Ophthalmological Congress, August 10, 1917, with discussion.

That the eye is influenced by the secretion from the ductless glands we know; but just how, when or what changes are produced in each case, we do not always know so well. Likewise we know relatively little concerning the chemistry of the internal secretions, in spite of the fact that our knowledge of this subject has increased tremendously during the past decade. This subject should receive more consideration from ophthalmologists than it does, in order to classify the etiology, symptomatology, diagnosis, prognosis and treatment, even though we are dependent upon physiologists, physiologic chemists and other laboratory experts for our basic knowledge.

The literature of the past 10 years contains many valuable articles upon this subject and the author has reviewed many of these, especially those appearing in ophthalmic journals. Notable among these, during the past year, are those by Lamb, Lisser, Schirmer and Zentmayer. However, to give all due place would make a book, even upon the hypophysis alone. It is needless to state that in the brief time allowed me such a discussion is impossible.

If we could be sure in any given case, from the eye symptoms alone, or even from the general symptoms, that we were dealing with hyper- or hyposcretion from this or that ductless gland, singly and unmodified by other glands, the problem would be greatly simplified. Fortunately or unfortunately, as the case may be, nature does not, as a rule, prescribe such an easy task, because overabundance of secretion from one gland is apt to be followed by the same condition in another gland as Lamb and others have mentioned. The result is stimulation of the sympathetic nervous system, especially in the incipient stage of hypersecretion from

the thyroid and later stimulation of the autonomic or vagotonic system from the thymus and posterior pituitary.

In as much as many of these cases consult an oculist first, either because of headache or predominating eye symptoms in the early stage of their glandular disease, it behooves us to be on the alert and to remember, as Grünwald has so tersely stated, that "we are physicians first and specialists second."

THYROID.

The sympathetic system is stimulated by secretion from the thyroid, circulating in the blood and lymph. In cases of slight hypersecretion from this gland, in which the secretion is not reinforced or antagonized, we see a transitory dilation of the pupils combined with slight widening of the palpebral aperature. This early in the disease we might not suspect the thyroid; but we should especially in women whom we are inclined to designate as neurotic. According to Noyes and many others, goiter occurs with much greater frequency in women. If this stimulation is continued over a long enough period of time, Kocher's or Rosenbach's (Hoeman's) or even Stelwag's signs appear. As the disease becomes more definitely established, Gifford's and von Graefe's signs appear, leading ultimately to the clinical entity known as Grave's or Basedow's disease. By the time exophthalmic goiter is well established, there is hypersecretion from the adrenals as well. In fact, at this stage of the disease the symptoms are produced by secretions from several of the ductless glands. For instance, if the blood contains secretions from the thymus or posterior pituitary, the pupils will be smaller than in the early stage of thyroid hypersecretion.

The following are the commonly recognized signs and symptoms of exophthalmic goitre:

1. Knies' sign is manifested by dilated and often unequal pupils. However, there is retained reflex activity. This is due to stimulation of the sympathetics and is so often present in the early stage of goiter. According to Lamb there may be associated with this a low grade chorioretinitis of the macula, and ciliary congestion. He believes this is worse in the eye with the more widely dilated pupil.

2. Von Graefe's sign, which consists in lagging of the upper lid in looking down.

3. Gifford's sign evidenced by difficulty in everting the upper lid. This is due to retraction and rigidity and often occurs early in the disease.

4. Dalrymple's retraction of the upper lid with widening of the palpebral aperture.

5. Mueller's sign, which is the same as Dalrymple's except that he includes the lower lid.

6. Next comes Höman's or Rosenbach's sign of tremor of the upper lid.

7. Stelwag's diminished frequency of winking often followed by a rapid succession of winks or a long interval without winking.

8. Retraction of the upper lid while an object is being fixed is Kocher's sign.

9. Joffroy's is present upon failure of the forehead to wrinkle, when the head is lowered and the patient looks up.

10. Aschner found that the pulse can be made slower by pressure upon the eyeball.

11. Loewe believes that adrenalin dilates the pupil in such cases.

12. Berger has called attention to lacrimation as an early symptom of Graves' disease. He believes this is due to stimulation of the sympathetic. Schmidt-Rimpler, on the other hand, believes this is due to irritation of the conjunctiva, as a result of the exophthalmos.

13. Jellinek and Rosin have noted the early pigmentation of the lids which later disappears.

14. Sattler and Gifford have each mentioned a solid-looking thickening immediately beneath the eyebrow and the latter author states this is found early and without marked exophthalmos.

15. Möbius noted a deficiency in, or even a complete loss of convergence power.

16. Sattler has attributed the occasional falling of the eye lashes and eyebrows to trophic disturbance.

17. Becker found spontaneous arterial pulsation of the retinal arteries in six cases out of seven of this disease.

18. As a new ocular symptom of exophthalmic goitre Suker has described a "deficient complementary fixation in lateral eye rotation" as follows: "After extreme lateral rotation of the eyes to either side with the head fixed and with fixation of an object at this point maintained for a second or two, on attempting to follow this fixation point as it is rapidly swung into the median line, one of the eyes—it may be either—fails to follow the other in a complementary manner into proper convergence and from this point when it is brought into the median plane. Either the right or left eye makes a sudden rotation into the fixation with its fellow, but before it does so, an apparent divergent strabismus is manifested. According to Suker, it is no doubt due to a dissociation in the functions of the sympathetic and the extraocular motor nerves of the eye, and perhaps also to exhaustion on extreme lateral rotation of the eyes."

19. Ocular bruit has often been mentioned as a symptom and has been discussed at great length many times.

20. A very infrequent symptom is ocular nystagmus.

PARATHYROIDS.

Insufficiency of the parathyroid glands may be responsible for zonular cataract and for eclampsia, convulsions of childhood and epilepsy. Tetany may also occur.

PINEAL GLAND.

The secretion, if there is any, from the pineal gland does not seem to have any effect upon the eye. It is possible to explain all of the eye symptoms present, when there is hyperplasia of this gland, upon the basis of pressure and it is reasonable to assume that this is the only way in which eye symptoms are produced.

However, Oppenheim believes that the symptoms from this gland are similar to those from tumors of the corpora quadrigemina. With disease of the pineal, the third, fourth and fifth nerves are not involved so often as when the corpora quadrigemina are diseased, but nystagmus is more often present. Frankl-Hochwart has expressed the opinion that tumor of the pineal body is responsible for unusual height, obesity, drowsiness, excessive growth of hair and a premature genital and sexual development associated with precosity of adolescence.

THYMUS.

In marked contrast with stimulation of the sympathetic by thyroid hypersecretion is stimulation of the vagotonic or autonomic system by hypersecretion from the thymus. Under such circumstances we find contracted pupils, narrow palpebral apertures, esophoria, spasm of accommodation, deep ciliary congestion and chorioretinal and scleral disturbances of circulation.

Persistent hyperplasia of the thymus was found by Garre in 95 per cent of fatal cases of exophthalmic goiter. Von Haberer obtained remarkable improvement, in a patient whose condition was very serious following a thyroid operation, by removing part of the thymus. According to Halstead's recorded cases, thymus feeding, radium and Roentgen-ray treatment improved remarkably patients who had not been benefited by thyroidectomy and ligation of the thyroid arteries for exophthalmic goiter.

Lamb states that "the more chronic inflammations may usually arise in conjunction with vagotonia, but such a condition as simple glaucoma is probably the end result of gonadal and adrenal insufficiency. Whereas acute inflammatory glaucoma is probably the result of a sudden imperative demand upon the adrenals for secretion to sustain the body in its attempt to defend itself against shock, fear, etc., in the presence of gonadal and adrenal insufficiency; for, although the secretion is forthcoming for a short period, the inability to continue to supply it causes a precipitate lowering of sympathetic tone and throws the balance under the control of the vagus. This, of course, in the presence of predisposing factors,

such as high hyperopic eyeballs and other anatomic abnormalities."

"This idea of the etiology is substantiated by the fact that pilocarpin and adrenalin, by hypodermic injection, overcome the attack; and, furthermore, stimulation to the sympathetic is well known to be always beneficial."

Bruner had his suspicions aroused concerning the pituitary in a patient requiring a frequent change of lenses, with the result that an early diagnosis was made and an early operation resorted to with a good result.

ADRENALS.

It is now, I believe, a well recognized fact that hypersecretion from the adrenals stimulates all the other ductless glands as well as the sympathetic system. Hypodermic injection of adrenalin seems to have the same effect as stimulation of the sympathetic nerve endings over the entire body. Adrenalin also produces contraction of the pigment cells in the skin, and probably in the retina of the frog, just as stimulation of the sympathetic does. However, the pituitary secretion seems to have a direct effect upon the blood vessels and not upon the sympathetics.

PITUITARY.

Bitemporal hemianopsia is present as a late symptom in hyperplasia of the hypophysis in about 40 per cent of the cases, but is a symptom for which we should not wait before making a diagnosis. The fields, according to Cushing, may early show a slight contraction from pressure of the pituitary upon the chiasm, and homonymous hemianopsia is by no means uncommon. In the absence of acromegaly, Uhthoff believes homonymous hemianopsia is very rare. Other authors have reported superior temporal slant of the peripheral field, scotomas and hemichromatopsia. Cushing ranks the ocular signs and symptoms as the most serious disturbance of the disease, and these are not always in proportion or direct relation to the enlargement of the sella turcica.

Neuroretinitis and optic atrophy are almost always late symptoms of the disease, although the former may occur quite early. Paralysis of the third nerve occurred in 15 per cent of the cases tabulated by Uhthoff. G. E. de Schweinitz has called attention to "antecedent amblyopia" as a very early and probably not a constant symptom of disease of the pituitary. This precedes other demonstrable ocular signs and symptoms.

One of the very best articles I have found on the ductless glands from the internist's viewpoint is by Dr. George Dock, of St. Louis, and appears in Osler's Modern Medicine, 1909, part 2, under the title "Diseases of the Ductless Glands." He gives due importance and place to the ocular symptoms.

Ott and Scott state that the secretion from various ductless glands produces hypersecretion of adrenalin into the blood, i. e., the thymus, thyroid, parathyroid, pancreas, pituitary, testicle and ovary have this effect. The reverse is equally true. Lisser and many others have emphasized the fact that very rarely do we see the result of disturbed or altered secretion in only one gland.

CASES.

The three following cases may be of interest:

1. Mr. G. W. M., age 44, banker, first consulted me February 21, 1912. He stated that at 9 years of age he lost his right eye from an injury, but that it was not removed until three years ago, in Iowa, because of sympathetic ophthalmia in the other eye. Recently, his vision has been failing, so that it was reduced to 15/20, and J. No. 2.

The patient is unusually fleshy; his face "looks flabby"; his lids droop, are edematous and the edges hyperemic; the eyelashes and eyebrows are brittle. Cerebration is quite slow. In fact, he states it is quite difficult to think.

Examination of the anterior segment of the left eye revealed a slight pericorneal injection of the scleral vessels; the cornea, iris and aqueous were hazy; there were a few posterior synechia, and very fine deposits on Descemet's membrane.

The fundus was negative except the disc looked quite pale even through hazy media, and there were a few fine

dust-like opacities in the anterior portion of the vitreous.

The field was concentrically contracted for colors, although the form field was negative, but there was no evidence of temporal hemianopsia.

The diagnosis of serous iridocyclitis associated with hypothyroidism must be evident from the symptomatology. Dionin and atropin were used locally and thyroid extract internally; the latter was prescribed by his family physician. He improved slowly but steadily under this treatment with a return of good vision and good general health.

As I see this case now, I believe the hypophysis, as well as the thyroid, was diseased. But, without an X-ray of the sella turcica, positive conclusions are less certain, although an X-ray examination could, of course, have been negative with disease of the pituitary.

Beck has reported a case in which the hypophysis was found quite large postmortem, as he expected from his clinical findings, but in some respects the case bears a striking resemblance to those of hypothyroidism, formerly called myxedema.

2. Mrs. V. D., age 32, married, complains of headache, slight nausea and prominence of the eyes for the past year. V. O. U. 15/15-1 and J. No. 1. There was noticeable exophthalmos of O. S. and more of O. D. with increased injection of the ocular and palpebral conjunctival vessels. Von Graefe's, Gifford's, Möbius', Knies' and Stelwags' signs of exophthalmic goiter were present. The fundi were negative.

Under a cycloplegic V. O. D. 15/30 $-=15/10+1.00\bigcirc+0.50$ Ax. 95°; V. O. S. 15/30 $-=15/10+1.00\bigcirc+0.50$ Ax. 80°. She was given a full correction for constant use.

Organotherapy, prescribed by her family physician, has produced less exophthalmos and an improvement in her general health. As all her symptoms are mild, operation has not been advised.

3. While writing this paper a third patient, Mrs. H. T. T., age 33, married, presented herself for examination with more than a moderate palpable enlargement of both lobes of the thyroid. She gave the usual history of asthenopia and neurasthenia. Her mother and one sister each have a goiter.

The anterior segment of each eye was normal and V. O. U. 6/6 — and J. No. 1.

Under a cycloplegic V. O. U. $6/7.5+=6/4+0.50$ Sph.

The fundus of each eye showed a low grade chorio-retinitis, which may be due to her hyperthyroidism, as her family physician has failed to find anything else in her general health to account for this. However, this was near the disc on the temporal side and did not involve the macula. In fact, I have not found involvement of the macula often.

There was a slight deficiency of convergence, but with so little hyperopia I advised against the wearing of lenses. She had been treated systematically by organotherapy without improvement, and, as two competent general surgeons had advised an operation for goiter, I concurred with their opinion.

In conclusion, kindly permit me to emphasize the importance of the low grade chorio-retinal changes is exophthalmic goitre or thyroid hypersecretion, as I believe these are too often overlooked. Too many observers probably expect to find grosser lesions. These changes may be due to the fact that too much light is permitted to reach the macula, as Lamb states he finds these more marked in the eye with the more widely dilated pupil; but I believe it is just as reasonable to assume that the stimulation of the sympathetic is the cause. Perhaps it is both.

We, in Colorado, should have a better opportunity to study this, on account of our excessive light, than our more distant confreres, if the former assumption is correct. If the latter is true, the increased pigmentation of the lids, which occurs early, may occur simultaneously with the chorio-retinitis.

DISCUSSION.

Henry Sewall, Denver, Colo., stated there appears to be no important specific action of any internal secretion on the eye, in the sense that atropin is a mydriatic or eserin a miotic. But as the eye is a tissue

complex in physiologic relation with all the rest of the body, internal secretions operate on its tissues as they do on similar elements throughout the organism; and as a part of the organic whole the eye must be affected in its functions and nutrition by what goes on elsewhere.

I will therefore devote the few minutes allotted to me to a consideration of some of the general physiologic relations of the internal secretions. We find here, as in so many other fields, evidence that there is no such thing as narrow specialism in ophthalmology, but that the well equipped eye doctor belongs to that group which "knows everything about something and something about everything."

It cannot but be useful for us to evaluate the position of these mysterious ductless glands in the economy. I well remember the day of relative positivism in physiology; when the mechanism of the reflex arc was the key to all nervous activity; when the combusion in the calorimeter seemed to be the last word in the explanation of protoplasmic energy; when nutrition concerned only the metabolism of compounds of carbon with a little sulphur and phosphorus salts and water, and there were no vitamines. I remember that when Brown-Séquard announced the vivifying effects from the injection of testicular juice he well nigh shattered a hard earned reputation as a safe and accurate physiologist.

Now we are ready to believe that if the external secretions prepare the food for the metabolic activity of the cells, the internal secretions prepare the cells not only for metabolism of the food but for all their recondite physioglogic relations.

For long years the lecturer on physiology had been introducing the unicellular ameba as an integration of all physiologic functions; and then he proceeded to show how, with the differentiation of tissues in the multicellular animal, there was a physiologic division of labor so that in the higher forms of life autonomous mechanisms were coordinated only through the fixed channels of nervous impulses.

It seems to me it was an advance comparable in importance with Harvey's discovery when in 1902 Bayliss and Starling showed that an acid extract of the duodenal or jejunal mucous membrane, when injected into the blood of an animal, caused its pancreas to secrete. They proved that the active principle, which they named "secretin," resided in the intestinal epithelium in an inactive condition (prosecretin); that wetting of the mucous membrane with dilute HCl, or the acid chyme, activated the prosecretin into secretin; that this product is soluble and is not discharged into the intestine but into the blood; and that the blood so charged, reaching the pancreas, causes this organ to secrete. Furthermore, it was found that secretin retains its properties after boiling. It is not an enzyme. Starling looked on it as a type of specific substances which, procured in one organ, reached another through the circulation and made the latter act; and he gave to this type of compound the name "hormon," from the Greek word meaning "to excite."

Every organ of internal secretion undoubtedly gives off an analogous chemical body. In the case of the adrenals the active principle has been shown to have a definite chemical formula, to submit to crystallization, and the same has recently proved by Kendall for a product of the thyroid gland, and by Robertson for his tethelin extracted from the hypophysis.

An illuminating discussion of the vital relations of the whole group of internal secretions, under the title of "Hormonic Equilibrium" was one of the evidences of great capabilities given by the late Henry S. Denison, who was cut off at the beginning of a most promising career some three years ago.

It is not too much to say that, though our knowledge of internal secretions and of the class of reactions which they set up is certainly but a small fraction of the truth, we must conclude that, directly or indirectly, internal secretions are involved in every vital act of protoplasm, and Cannon has shown that they must be considered as a physical basis of emotions if not of all physiologic activity.

It is universally admitted that each gland of internal secretion produces a definite chemical product which enters the circulation and modifies the action of various cells in specific fashion. There are two ways in which modification of this secretory function may bring the ductless glands within the view of the pathologist and clinician, first through hypersecretion, second through hyposecretion. Both may be equally disastrous, and each adds to its own pathologic changes. But there is a respectable opinion that ductless glandular disorder is not simply quantitative in its influence, but may be essentially qualitative. That is, that there is a perversion in the chemistry of the glandular secretion, which deprives it of useful function and makes it distinctly poisonous to the body in any concentration.

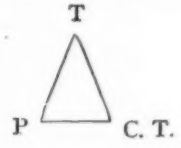
There is a fourth view of the origin of dyscrasias dependent upon glandular disorder aside from the secretory function. There is reason to believe, namely, that the ductless glands are specifically detoxicating organs necessary to the neutralization or destruction of poisonous matters added to the circulation as the result of normal cellular metabolism or of the intestinal absorption. It is worth while to touch upon the evidence from this point of view. Thus, it has been found that when an animal is thrown into tetany through removal of its parathyroids, the tetany is relieved by bleeding the animal and injecting salt solution. Presumptively, this treatment removes from the circulation certain poisonous matters

which it was the function of the parathyroids to destroy.

Still stronger evidence has been furnished for a detoxicating function of the adrenal capsules. When the suprarenal bodies are removed from a frog the effect is finally fatal. If, while still moribund, the frog is bled and its blood is injected into a normal frog, no ill effect is witnessed. But if the injection is made into a recently decapsulated frog, the latter suffers a rapid paralysis and death. Moreover, if this poisonous blood is injected under the skin of a normal frog in which a ligature has been previously thrown about one thigh, cutting off its circulation but not including the nerve trunk, after three hours the muscles of the ligatured leg contract normally when their nerve (omitted from the ligature) is stimulated; while stimulation of the nerve of the opposite leg, where the tissues have been bathed in the poisonous blood, produces no effect, though the muscles contract when directly irritated. The obvious conclusion is that the blood of a frog from extirpation of the suprarenal bodies contains substances which paralyze the end plates of the motor nerves somewhat as does curare.

Unfortunately for our therapeutic endeavors, the matter is still more complicated than has been represented. The investigations of Falta and others indicate that there is no such thing as the isolated action of a single ductless organ; that all the glands of internal secretion are mutually engaged in maintaining a normal biologic equilibrium and that necessarily there must be a readjustment in toto when the action of one is modified in order to preserve what we call health. A great service has been rendered by Falta and his colleagues in showing that there are natural mutual exciting and inhibitory relations between at least certain of the ductless glands. Thus the thyroid and the chromaffin tissues are mutually stimulating while the insular apparatus of the pancreas tends to inhibit both.

These relations may be represented by a triangle, the three angles representing the pancreas thyroid, and the chromaffin tissue:



The internal secretion of the pancreas tends to inhibit the effects excited by activity of either thyroid body or chromaffin tissue (most abundantly localized in the adrenal medulla) while the secretions of both the latter organs mutually stimulate their tissues of origin, or at least magnify their effects.

Finally, it may be said that a welcome and hopeful element of exactness has accrued from researches in this field. It is generally granted that adrenalin or epinephrin, the active principle of the adrenal medulla, is a specific stimulant for the receptive substance at the peripheral termination of the sympathetic nerves, and that its pharmacologic effect, whether of excitation or inhibition, depends upon the corresponding function of the nerve involved. Contrariwise an interesting analogy is furnished by the discovery of Langley that nicotine is equally selective of the receptive substance mediating between the sympathetic filaments and the ganglion cells of the peripheral ganglia interposed in the paths of the centrifugal fibres.

I have tried to show that whatever facts of mechanics postulate a relation between any of the ductless glands or their secretions and the eye it is true to a peculiar degree that comprehension of any local reaction to the internal secretions must be founded on an apprehension of their general relations.

Edward Jackson, Denver, Colorado, thought that, with reference to exophthalmic goiter, the older observation of the influence on the sympathetic nervous system had been considerably overworked. Manifestations of nerve action in connection with the cranial nerves, observed in relation with the eye, seemed to have certain characters in common. They seemed to be all largely disturbances of coordination. At least we might group them in that way. The failure to wink is a failure of reaction to normal stimuli. The failure of the eyelid to follow the eyeball as the eye turned down (the Graefe sign), the failure of elevation of the eyebrow, all these things seemed to represent a failure of coordination of action on the part of the central nervous system, and probably of the cerebrospinal nervous system instead of the sympathetic. This suggestion might prove more fertile in the minds of those who, like Dr. Sewall, were studying the physiology, than in the minds of those who were concerned strictly with the eye.

M. Jean Gale, Denver, Colorado. I saw a case of exophthalmic goiter yesterday. With all the symptoms of exophthalmic goiter there were also marked choreic movements.

Harold Gifford, Omaha, Nebraska, said that with regard to the connection between the emotions and the secretion of the adrenals, he had had a curious corroboration in his own person. For some years, when he had become very much excited he had experienced a decided and depressing pain in the lumbar region, lasting about five minutes. Dr. Jackson's remarks on the lack of coordination seemed to him to be well worth considering. But it may be questioned whether some other explanation does not more accurately fit some of these symptoms. For example, the symptoms known as Dalrymple's, as well as several others, all

might be explained as due to overstimulation of the sympathetic. With regard to the connection between chorea and hyperthyroidism, there is another explanation. Every now and then a case of hyperthyroidism is cured by removal of the tonsils, and this suggests that both the chorea and the hyperthyroidism may have been due to tonsil infection.

F. R. Spencer (closing). I believe we should change our terminology a little and speak of exophthalmic goiter as hyperthyroidism, contrasting this with hypothyroidism.

RELATION OF RETINITIS PIGMENTOSA AND ALLIED CONDITIONS TO THE DUCTLESS GLANDS.

E. L. JONES, M. D.

CUMBERLAND, MD.

This paper reporting a series of cases of retinitis pigmentosa treated by thyroid extract was read before the American Academy of Ophthalmology and Oto-Laryngology, October 30, 1917.

Some time in the year 1910 there came to me, for considerably impaired vision in both eyes not helped by glasses, a mulatto girl, 15 years of age. Ophthalmoscopic examination showed black spider splotches on the dark fundus natural to the negro; not readily visible at first inspection, and being the only case of retinitis pigmentosa I have seen in the colored race. Being mindful of the futility of treatment for this disease, as far as text-books and literature went, it occurred to me to strike out in some other direction; and as thyroid extract had been proven in late years to have so marked an influence on retarded mentality in certain states, as cretinism, and a mysterious influence over constructive metabolism, this was the agent selected. This view was further strengthened by the close relation of the optic nerve to the brain, giving rise to the expression that "The optic nerve is the finger of the brain." Unfortunately, this case could not be followed up, as the patient removed shortly afterward to Baltimore, and could not be traced.

The earliest case of which a record could be made is the following: C. E. J., male, aet. 42, August 16, 1910. Sight known to be failing for several years, with both temporal fields moderately contracted, and partial night-blindness. R. V. = 18/60, Jaeger No. 10. L. V. = 18/50, Jaeger No. 10 +. No improvement by glasses, far or near. Pupils medium size, not reacting to light, but doing so on convergence. Marked retinitis pigmentosa, both eyes. Put on thyroid extract, one grain three times a day. Took one bottle of tablets, probably one hundred. As this patient did not return, a letter of inquiry was sent, to which he replied on February 5, 1912, sending samples of fine print for close, about Jaeger No. 7 for each eye, and 20/80 + for distance. He was located and induced to return on July 29, 1916; pupils slight movement to light, dilate slowly in dark. R. V. = 20/40. L. V. =20/50. Each with Sph. + 4 Jaeger No. 3; together Jaeger No. 2 easily. Fields almost full, except temporal ends. Fundus the same, highly pigmented. Put back on one grain thyroid three times a day, to which was added 1/60 grain strychnia and 1/30 grain arsenic. The arsenic was added from a belief in its alterative value, and the strychnia as a bitter tonic, only indirectly beneficial to build up lowered nerve tone. This formula has been in use for several years past, as will be seen in later cases. He was induced to return on August 19, 1917, having taken four boxes of sixty pills each. R. V. =20/40 — Sph. + 4. = Jaeger 1 —. L. V. 20/50 Sph. + 4. = Jaeger 1. Both eyes open V. = 20/40. Pupils fixed; fields probably a little more con-

tracted at temporal sides. The notable feature is that the downward tendency of the disease, as far as this single case is concerned, was checked by the first treatment, covering only one month.

Case II. Mrs. S. E. R., aet. 50, came shortly after the previous case, complaining she could not see to read with any glasses, which fact was verified by tests. A record made at the time, and checked off on one or two return visits, was hopelessly misplaced, but fixed sufficiently in memory to be sure she could not read a newspaper with either eye, and in all respects had a fully typical retinitis pigmentosa, with night blindness. She was put on thyroid alone, and by request returned on June 3, 1917, volunteering the statement she knew her sight was better. Best attainable vision R. 20/75 Jaeger 4—. L. 20/50 Jaeger 2. She has taken the tablets on frequent occasions during these years.

Case III. D. H. W., aet. 44, August 18, 1910. This case is reported by reason of being an uncle of Case IV, and probably indicating the course of the disease in this particular family. Noticed first failing of sight, twenty years ago, for night only. Seen by me in 1906, with clear diagnosis of retinitis pigmentosa. Previous to this, he had been under the care of one of Philadelphia's leading oculists, receiving strychnin injections and electric treatment. In 1906, V. = 20/50 each eye, Jaeger 3. Seen in 1908 with rupture of cornea of left eye and traumatic cataract. R. V. = 20/80. Sph. + 3. Jaeger 6—. Fields much smaller. Pupils dilate very slowly in the dark. Some parts of fundus entirely black. As an experiment he was put on two grains thyroid t. i. d.

February 7, 1911. V. = 18/120 Sph. + 3. Jaeger 12. Fields more contracted. Beginning cataract. Gave trial injection of cyanid of mercury with dionin subconjunctivally.

September 23, 1912, V. = 9/200. Jaeger 14. I think, and he believes, it is the cataract more than the retinal disease reducing vision. Put back on thyroids with arsenic in increasing doses, which he took until the heart was upset by the thyroid, and the stomach by the arsenic.

August 21, 1917, returned by request. Barely counts fingers. Pupil almost opaque. Light fields as large as five years ago. In view of the formation of the cataract, which seems sclerosed and permits a little light to pass through by electric ophthalmoscope, it is not possible to draw any conclusion as to what the sight would be had no cataract formed.

Case IV. B. F. W. Aged 28. September 15, 1915. Nephew of Case III. Night blindness since eight years old. Had been educated as a pharmacist, and had secured a position in Philadelphia, where he took treatment from the oculist who treated his uncle. Realizing the gravity of his condition, he decided to give up his profession and return to rural life near his small home town. He has distant atrophy of retina and optic nerve, contracted retinal vessels, and very fine pigmentation, visible only by direct examination as fuzzy, chopped up hair all over fundus. V. each varies to 20/50 +, and Jaeger 3 to Jaeger 1. Fields contracted to a five-inch circle at twenty inches with an acute indentation, fingerlike, c[illegible]n-poral sides.

Sept., 1915, put on two grains thyroid, and increasing doses Fowler's sol. of arsenic, three times a day. Feb. 22, 1916, R. V. = 20/40, Jaeger 2 +. L. V. = 20/40, Jaeger 1, clearer. Add strychnia and arsenic to thyroids in pill form. Tests made on Nov. 16, 1916, Jan. 31, 1917, and Aug. 27, 1917, all about the same. Fields are as large as at beginning. Pupils do not react visibly, but on remaining in the dark quite a while, they enlarge as though a weak mydriatic had been used, and are correspondingly slow in returning in bright light. V. each eye 20/40 readily, with some of 20/30, and Jaeger 1 easily, each. The value of a slight raise in these cases is in showing arrest of downward tendency of disease.

Case V. C. H. Aged 10. May 17, 1913. Convergent strabismus right eye; very poor use of the left. Skull lopsided, teeth terraced on front, no enamel on tips. R. V. = fingers four feet;

no Jaeger. L. V. = 18/160, Jaeger 6-8. Dilated pupils. By shadow test both eyes hyperopia 7D. Optic discs fibrous, retinal vessels white streaks with red centers; entire fundus studded with black spots like pepper, coarse and fine, thickest at periphery, and more black than red area. Sight worse in fading light; fields good. Pulse 60. Blood pressure 85-90. Put on one grain of thyroid t. i. d. on alternate weeks.

December 23, 1913. Pulse 100. Blood pressure 85. V. = 20/100 +, Jaeger 4-3. Gets on in school better. In this case, the improvement in vision may be due to wearing the glasses. Returned by request on:

September 17, 1916. Took tablets only in 1913; L. V. = 20/75 +, Jaeger 3. Pulse 60. Blood pressure 92. Pupils active. Put on prescription: strychnin 1/100, arsenic 1/50, thyroid 1 grain t. i. d.

September 23, 1917, V. = 20/50 +, Jaeger 1 —. Retinal vessels at disc barely colored, soon becoming white threads. Choroidal vessels visible where pigment is not massed. Family history indicates hereditary specific infection. Sees better than formerly by dim lights.

Case VI. Mrs. S. Aged 50. May 18, 1916. Came to get "good specs," so she could see; would not be convinced it was a case of bad eyes, although her father had been blind many years, and several of his relatives blind or near-blind, some of them presumably from the same disease. Noticed night blindness before twenty years of age. Retinitis pigmentosa, both eyes of extreme degree. Pupils inactive to light and convergence. V. each 20/75 — sph. + 4, Jaeger 3 each. Fields in circle of one foot diameter, one and a half foot removed. Put on strychnia 1/60, arsenic 1/30, and thyroid 1 grain three times daily.

July 18, 1916. Has taken the above irregularly. Barely visible motion of pupils to light, readily so to convergence. V. each 20/50, S + 4.0, Jaeger 2—.

September 18, 1916. Has been taking irregularly. V. each = 20/50 S + 4.0, Jaeger 3 each. Jaeger 2 jointly. Pupils dilate slowly in dark room, but not to quick exposure. Patient could not be induced to return any more, but showed demonstrable improvement in the four months of observation.

The next two cases are introduced to support the thyroid and hypophyseal implication in the origin of the disease, being sisters in a family of five children, one of whom, a boy, died at about eighteen years of age, having the same degree of night blindness and overgrowth of body in general as the sisters reported. The other two children were each seen, and had normal eyes and bodies. The mother has a large goiter, which was present during all her childbearing life, and likely deficient in providing its proper amount of internal secretion during the gestation of these children. The skeletal disproportion, and extreme adiposity, with abundance of hair on the head, fit fairly the description given by Cushing of dyspituitarism.

Case VII. L. C. Aged 14. July 29, 1905. Alternating divergent strabismus as long as can remember. Absolutely blind when darkness approaches. Enormous weight. V. each eye = 18/120 +, Jaeger 7 poorly. Wearing sph. + 2. Visual fields much contracted. Pupils normal. Cyl. + 2, ax. 90°, each, called for. This does not raise V., but dulls badly by reversal of axis. Both eyes disseminated spiders of black pigment, with splotches on retina, up to region of macula, typical retinitis pigmentosa. Gave cylinders, and put on long course of small doses of arsenic and nitroglycerine; the first because of its supposed effect on metabolism, and the latter that it might theoretically cause increased waves of arterial blood supply for a short while after each taking.

Next seen August 14, 1911. Fields and appearance no worse. Has seven-year old sister weighing one hundred pounds, with night-blindness. Renew arsenic and trinitrin. Patient's mother had goiter since eighteen years of age.

Next seen November 11, 1916. Has been having severe scalp trouble, with bald spot on head. Walks like semi-blind person. Pupils active. V. = 20/

100 + each, Jaeger 3 readily. Optic disks very white, retinal vessels small. Less pigment, especially near disc than record would lead me to expect. Visual fields not over 8 inches in diameter at one and a half feet.

Mother replies to question as to menstruation, that she misses as much as three years; that she took the treatment prescribed on each of the former occasions, about six months. Put her on the strychnia, arsenic and thyroid pills.

August 13, 1917. V. each 20/75 —, Jaeger 2 +. Slight pigmentation in the right, more in left retina. Optic nerves atrophic. From misunderstanding of instructions, left off treatment when overstimulation symptoms appeared, and did not resume. Gave prescription for one grain each of thyroid and pituitary.

Case VIII. V. E. Aged 12. November 11, 1916. Sister to above patient. Enormous overgrowth of body, massive, expressionless countenance, luxuriant, long, silky hair. Night-blindness complete, even with full moon. Contracted visual fields, poor control or sense of direction of eyes, low ability to observe, keen memory. Pupils small and act to light. V = each 7/150, Jaeger 3. Sph. 3.0 each 20/100 +. With dilated pupils it was hard to make a critical inspection of the fundus, as eyes wandered in all directions. But the fundus was dark, with no red; disks pale, vessels small. Put on half adult dose of arsenic, strychnia, and thyroid.

August 13, 1917. Took above only a few weeks, from misunderstanding of directions. Fundus slate color; optic disks and vessels atrophic. V. each eye 20/75 — R. Jaeger 1, L. Jaeger 2. Prescribed thyroid with pituitary.

It was deemed worth while to try the thyroids on cases of atrophy other than retinitis pigmentosa, in certain cases of congenital atrophy of children, with low vision and pallid nerves. But none have been followed on which to report reliably, as they could not be induced to persist in treatment, or return for observation. For instance, about twelve years ago, a boy had his left eye ruptured, and examination at the time showed congenital atrophy of right optic nerve with V. = 20/60 —, at which point it stood unchanged, as opportunity to examine it recurred many times. In February, 1917, he felt need of visual help, and was put on the arsenic, strychnia, and thyroid, but shortly after removed to New Mexico. In reply to a letter of inquiry in September, 1917, he sends clipping marked for 20 feet, which, when compared with test chart, seems to about equal the 25 feet line, and print the size of Jaeger 1 read at ten inches, but as he was not tested by standard letters, the result is dubious. He took only a month's treatment.

Case IX. On August 8, 1914, H. D., aged 18, came for dullness of sight and hearing. He was mentally defective to the extent that he could not be trusted to travel alone, and also in other evident respects. He had rapid nystagmus in both eyes, with V. 20/75 —, Jaeger 3, and 20/40 +, Jaeger 2, right and left respectively, not raised by glasses. No encouragement was offered as to helping the vision or nystagmus, but his mother was advised to put him on thyroids, a good portion of the time for two years, on the expectation of improving his mentality. By request, he returned August 9, 1917; general improvement in facial expression and manner were evident at a glance, and corroborated by his conversation. V. R. 20/50 +, Jaeger 3 +, V. L. 20/40 +, Jaeger 1 —, and the nystagmus was so infrequent as to hardly attract notice.

The following were observed long enough to report upon:

Case X. S. McD. Aged 64. September 26, 1912. R. eye blinded by iritis fifteen or more years, pupil occluded. No perception of light. L. severely damaged eight years ago by iritis, pupil nearly occluded, which conditions were incidentally observed several years ago, when he came in company of a brother who had an acute iritis in one eye, he being used as a text to illustrate what harm iritis could do, when not treated. L. fundus could be seen, the choroid being atrophic, but not destroyed. He

had been told when seen on trip several years before, that nothing could be done, so the purpose of this trip was to see about a deafness, which tuning fork tests showed to be in the nervous apparatus of the ear.

He was put on mercury with chalk, strychnia, Dover's powder, and thiosinamin pills, and returned on November 30, 1912. Following this, pupil was visibly contractile, V. = 6/200 with strong — sph., Jaeger 14. The choroid had the color and appearance of grained oak, no red being visible, and optic disc a mere splotch, with vessels hardly visible, and soon vanishing. It was suggested he try thyroid, and he was given 2 grain tablets, three times a day. February 25, 1913, V. sph. — 6 = 18/200 — 2 Jaeger 8 partly. August 8, 1913, S — 6.0 V. = 20/100. S. + 3.0, Jaeger 2 —. December 1, 1916, V. about same, with partially intoxicated patient.

Case XI. M. McD. Aged 60. March 21, 1913. Brother to Case X. Made one visit several years previously for acute iritis of two or more weeks duration in one eye; other normal. R. pupil fairly large, no reflex to light. V. = fingers one foot; only seen in outer field. General atrophy of choroid, red lining being substituted by fibrous-looking tissue with symmetric splotches, containing black spots, comparable to "dog tracks," and some tallowy flakes. L. pupil sluggish to light; V. fields full; fingers six feet. Choroid atrophied, with red bands in it. Pigment massing small. Pulse 70. Blood pressure 205. Put on thyroid tablets, 2 grains each. T. i. d., subject to heart action. Seen in 1914, L. V. = 20/100. July 8, 1916, L. V. = 20/75, Jaeger 6, with 5.0 D. Sph. Field full. Splotches in L. around macula area, worse than in R. Renew thyroid, with strychnia, arsenic, and iron. This patient was never seen again, but brother reported the pills excited his heart so that he gave them to said brother to take.

Case XII. H. D. Aged 69. May 17, 1916. V. each 20/75 S. + 4.0, Jaeger 4 each. R. pupil enlarged and sluggish, except to reflex action. O. D.'s atrophic both eyes. R. field contracted. Tension up, each eye. Blood pressure 136. Prescription, strychnia, arsenic, and thyroids.

June 19, 1916, R. V. = 20/50, Jaeger 3. L. V. = 20/75 — Jaeger 4 +. August 18, 1916, pupils both eyes active. R. V. = 20/40. S + 4.0 Jaeger 2. L. V. 20/75 + Jaeger 6. Fatigues quickly.

October 18, 1916. Pupils small and active to light. V. as before. December 19, 1916, V. as before, with same Jaeger 1. Pupils small, with normal reactions.

April 20, 1917, R. V. = 20/40 S + 4.0 Jaeger 2 +. L. V. = 20/75 Jaeger 6. July 1, 1917, pupils normal size, R. immobile, but slowly dilates in dark. L. active. V. as previous test.

It will be observed the right greatly improved, and the left ceased to get worse. This patient, as also Case IX, was quite dull of hearing, and tuning fork tests showed nerve impairment. Improvement in both cases in the hearing was marked, it requiring no more effort to converse at ten feet on the later visits than it did for three or four at the beginning. It looks reasonable that whatever would improve the tone of the optic nerve, would do the same for the auditory. This has been borne out by the result of thyroid treatment in several cases of congenital sluggishness of hearing in children, but not enough to put them in the deaf-mute class. It has also been tried in one case of essential anosmia, in which the sense of smell was greatly increased.

It has always been an unexplained mystery as to why the particular form of optic atrophy manifesting night-blindness would be accompanied by pigmentation of the retina, and likewise why all cases of night-blindness do not have the pigmentation, the "Retinitis Pigmentosa sine Pigmente." In my belief the disease is due to pluriglandular deficiency of the ductless glands, which may be impaired in varying degrees respectively, and in some instances, either the thyroid, adrenals, or the pituitary continue to functionate sufficiently. Breaking down of the adrenals would explain the pigmentation on the same basis as it explains the dark skin in Addison's disease.

The part played by each of the ductless glands individually cannot be exactly gauged in the present state of ignorance of the ultimate physiology and pathology of said endocrine glands. Dr. Crile in his masterful experimental pathologic, and clinical studies, has gone deepest into the mysteries of life, and its relation to the ductless glands, and the effect of their increased or suppressed secretion on the mental, muscular, and vital organs, of anyone living. His wonderful formulation of these studies in his theory of the "kinetic drive" will be a medical classic for generations to come. He has shown how in the animal kingdom these secretions are augmented in the struggle of combat or flight for life, and how they become exhausted by long continued fright, loss of sleep, and traumatism. He has shown how in the human the distressing emotions of anxiety, fright, flight for life, do the same things; and has demonstrated histologically in animals, and on a soldier of the Belgian Army suffering the privation and terror accompanying the first German drive over that unfortunate country, the structural cellular changes in the brain, adrenals, thyroids, and liver, at first increased fullness and size, followed by shrinkage and diminution.

It is well known that mild stimulation of any organ or function, followed by due rest, is strengthening to said organ; but excessive and long continued overstimulation is followed by exhaustion, either fatal to recovery, or making restoration long delayed. Herein comes from the great experiences of the world war, what to me is the strongest evidence of the dependence of night-blindness on the ductless glands. French, German, and later English statistics show great numbers of night-blindness in the trenches, as compared to the same in times of peace; these reports also come from Asiatics in British service in Egypt.

The Journal of the A. M. A. for September 9, 1916, has the following abstract: "The frequency of hemeralopia extremely low in times of peace (1 in 12,000 in France, according to Walter) undergoes an augmentation in war time. At Verdun, Dr. Bordier found 8.78 per cent in ocular examinations during the winter of 1914-15. At the same period, there occurred in the German army, a grave epidemic of this condition. More recently, Vejers has observed it in the proportion of 10.2 per cent. This high figure depends on many causes, some peculiar to the present war, which presents conditions different from those which prevailed in the past, such for example, as the higher mean age of the combatants. The hemeralopia in this war differs from cases which have been described in previous wars in two respects. In the first place, there has been no epidemic, and the revictualing of the army being satisfactory, there have been no crises of hemeralopia due to privation and physiologic misery. By reason of selection, symptomatic hemeralopia is rarely found more in military than in civil life. In most cases, it seems related to some vice of refraction, and principally to myopia. The condition has been observed among volunteers in the early months of the war, among officers of the regular army, and because of these facts and others contained in the report of the commanding officers, and because of the isolated character of each case, it is evident that, in the presence of war, hemeralopia is a symptom rarely invoked by malingerers. Except to those cases traceable to general disease (of liver and kidneys), or to ocular fatigue or disease, there seems to be no satisfactory treatment for the condition.

"With regard to military employment of patients suffering with hemeralopia, . . . it is necessary to point out that the condition appears to be scarcely if at all curable . . ."

This quotation is made for the value of its statistics; also to show that those having this disease were subject to long continued stimulation of watchfulness, loss of sleep, or the emotions accompanying the life or death struggle, which would at first increase the endocrinous secretions, and later exhaust them. Theoretically, at first there

would be an oversharpness of night vision, followed later by its collapse.

In some preliminary remarks on this subject before this society last year, the essayist ventured the prediction that with the rest following peace, these cases would not develop retinitis pigmentosa beyond the normal low rate percentage, but were only functional, and would return to normal. This is borne out by a statement in the *Lancet* in June past; which says that most cases of hemeralopia in soldiers pass off with rest and relief from duty.

The British Journal of Ophthalmology for August, current year, also states night-blindness is common in British and Indian soldiers, but no organic disease is visible. Weekers in Archives d' Ophtalmologie, March-April, 1916, reports night-blindness in ten per cent of examined cases; refraction errors frequent. He attributes it to nerve-shock. Landolt, Paris Ophthalmological Society, reports much night-blindness associated with uncorrected ametropia, which he treats by rest, rich diet, strychnia, arsenic, cod liver oil, iron, potassium iodid. Eason, in the British Journal of Ophthalmology, August, 1917, reports much night-blindness in Cairo and Alexandria, due to simulation, malnutrition, etc. A few cases of real retinitis pigmentosa.

As pointing to the specific disturbance of the adrenals from these war conditions, the following is valuable: Journal of the A. M. A., June 16, 1917, in a review from Russ. Vracth, Petrograd. "Yushtchenko relates that he has encountered a number of cases in soldiers which would have been classed with the traumatic neuroses if it were not for the fact that the men presented certain symptoms, which we are accustomed to encounter with Addison's disease, especially the pronounced bronzing. Analysis of the cases shows further a deficiency in the functioning of both parts of the suprarenals."

Ophthalmic Literature gives the following title: "Fusita—Relation between Adrenals and Retina. Nippon Gank. Zasshi. Sept., 1916." An effort was made, through the courtesy of a friend in the Army Medical School at Washington, to ascertain the substance of this paper, but the journal was printed in Japanese-Chinese characters, and several Japs turned down the task of translating it.

Another reference of value is from Progrés Médicale, Paris, March 24, No. 12, p. 95; also from abstract in Jour. A. M. A. "Thyroid-Parathyroid Treatment of War Neurosis—Blank comments on the remarkable frequency of abnormal thyroid functioning in the men in active service. He recalls that the thyroid is peculiarly susceptible to emotional stress, overfatigue, and defective hygiene, which readily explains why so many of the troops present evidences of abnormal thyroid and parathyroid functioning. He has found the oculo-cardiac reflex a good index of conditions. With these functional disturbances of the nervous system this reflex is usually exaggerated, indicating vagotony. Under thyroid or parathyroid treatment, or both, this reflex disappears, or becomes inverted as recovery progresses."

The first published reference which came to my notice of giving extracts of the ductless glands in eye disease, was by Dr. S. B. Muncaster, of Washington, in the Ophthalmic Record for July, 1912, in which he advocates a tablet of 1 grain thyroid, 1/60 grain adrenals, and sodium cacodylat 1/200 grain, in retinitis pigmentosa and choroiditis where there are old pigment deposits, at the beneficial effects of which he expresses surprise. Of late some remarkable results are being reported, of pituitary body disease treated by glandular extracts, either by mouth, or by injection of pituitary.

In the Archives of Ophthalmology for March, 1917, are two very elaborate articles on the hypophyseal relation to retinal disease, with treatment by its glandular extract, narrating improvements that would hardly seem credible if emanating from obscure sources. One is by Drs. de Schweinitz and How in Philadelphia; the other is by Drs. Elsberg and Krug in New York. The latter give a reference to the Proc. of Royal Soc. of Med., 1915, v. VIII, No. 3, Sec. on Ophth., p. 32, in which Eason

described a patient who was practically blind, who recovered normal vision and nearly a full field in one eye after thyroid feeding. The improvement had persisted for nine years; the patient had to take small doses of thyroid from time to time, otherwise vision would begin to fail and headaches return. While in New York last June, I had the opportunity to read Eason's article, which was short, with no theory or explanation as to why thyroid was given, or how it was supposed to act; but as his case was treated in 1907, it is probably the first on record in which this treatment was applied. Let us hope this will not prove a bubble—fair to look upon, but ending in nothing.

SUCCESSFUL REMOVAL OF A BULLET IMBEDDED IN THE ORBIT TEN YEARS.

OTIS ORENDORFF, M. D.

CANON CITY, COLO.

Report of case read before the Third Colorado Ophthalmological Congress, August 10th, 1917, with discussion, and two illustrations

August 10, 1916. Mrs. F. Age 25. Small and delicate, weight 90 pounds. Ten years ago was shot in right temple by a jealous lover who, supposing that his victim was dead, committed suicide by a shot in the head from the same weapon. The revolver used was a .38 caliber and was held so close that the powder burned the face.

Since the injury there has been con-

FIG. 1.

Radiogram showing bullet in orbit and pin placed over supraorbital foramen to localize it. Orendorff's case.

stant headache and great irritability manifesting itself in terrific explosions of temper, and there is also complete ptosis of the right eye and marked convergent strabismus. A depressed scar is present on the right temple at a point one inch behind and one-half inch above the external angle of the orbit. Radiograms showed that the path of the missile was horizontally inward and slightly forward, stopping at the upper part of the orbit and about two-thirds of the way back from the margin. The bullet turned point downward and the upper part was imbedded in the bone.

Under ether an incision was made at the external orbital margin similar to

FIG. 2.

Showing complete ptosis. Patient attempting to raise upper lid. Orendorff's case.

the part of a Kroenlein incision and the periosteum of the orbit was separated with nasal submucous elevators back toward the apex keeping well in the superior part of the orbit. In this manner a solid bony obstruction was encountered above and to the nasal side and back of eyeball. A Metzanbaum nasal retractor which is soft and pliable, which I consider very essential, was shaped to conform to the bulb, and the periosteum with the bulb was drawn in and down and forward as far as possible exposing the field to a surprising extent.

The bony obstruction was only a thin shell very easily chiselled away, leaving the bullet exposed and so tightly imbedded that it could not be dislodged with a strong hemostat and a small mastoid chisel was necessary to loosen it. A battered soft bullet is, as a rule, hard to remove, and this one was no exception, for the patient manipulation required to get the long axis swung around in the right direction was the only difficult part of the operation, but the utmost caution prevented the sharp jagged edges from injuring the orbital structures.

Recovery with entire relief of pain was prompt, but the ptosis and squint persisted until relieved by operation last April. A recent letter from the patient states that it is almost impossible to detect that there has ever been anything wrong with her eyes. As the vision was at once 5/60 in the operated eye, and as it is orthophoric, a permanent, satisfactory result is anticipated.

While it is hardly possible that so simple a method of exposing the orbit for the removal of foreign bodies is original, I fail to find it recorded. If it should be considered too common to be worthy of a place in ophthalmic literature, I am certain that the use of a soft pliable retractor possesses wonderful advantages over any other kind, and this one feature alone is worthy of merit and justifies me in calling attention to it.

DISCUSSION.

Harold Gifford, Omaha, Nebraska, did not remember seeing a similar case. (Orendorff in reply to Gifford's question said that the bullet was two-thirds of the way back in the orbit). He did not understand how the bullet could cause so much pain. He remembered a case in which a man on a railway platform was hit by a bullet fired from below into the air. No external evidence of the injury could be found, but the patient was sure he had been hit by the bullet and that he could not see. The X-ray showed a bullet near the optic foramen. There was a small wound of entrance deep down in the conjunctival sac. In that case the bullet was doing no harm and no further notice was taken of it. Axenfeld had devised a retractor for going into the orbit, but this was broader than that used by Dr. Orehdorff and did not reach in quite so deep.

IMPORTANCE OF TEMPERATURE CURVE FOR THE EARLY RECOGNITION OF INTRAOCULAR TUBERCULOSIS.

HARRY AUSTIN SMITH, M. D.

DELTA, COLO.

Paper including reports of two illustrative cases read before the Third Colorado Ophthalmological Congress, August 10th, 1917, with discussion.

It will add to the clarity of the title if extended to include retinal vessels as well as posterior chorio-retinitis. In searching the literature, which was not very extensive, and referring to the late text-books on the subject, there was no instance in which the diagnosis of tuberculous retinitis was put on a firm foundation. By exclusion, and as a last resort, the conclusion is reached that tuberculosis is the intraocular lesion.

There is no new principle or pathology to be introduced by the writer. But a different interpretation and application of old ones. The history and pathology of tuberculosis needs no repetition at this time.

The indictment against the oculist for failing to recognize a tuberculous lesion of the fundus is severe. The discovery of a fundus lesion by the ophthalmoscope should immediately call to the examining surgeon's mind the trinity; syphilis, nephritis and tuberculosis. What the Wassermann is to syphilis, albumin and blood pressure to nephritis; so is the temperature curve to the tuberculous fundus lesion.

C. Adam, of Berlin, states in his book Ophthalmic Diagnosis: "Exclusion of every other cause * * * and the existence of tuberculous lesions elsewhere in the body" then a fundus lesion may be called tuberculous. It is to emphasize the point that it is immaterial whether there exists, or the internist finds, a tubercular lesion elsewhere, that I present this paper. It is better logic to assume that a fundus lesion is primary than to insist that a lesion must be found somewhere else in the body.

In tuberculous meningitis, or miliary tuberculosis with fundus lesion, the diagnosis is selfevident. Given a young and healthy appearing patient with a fundus lesion, negative Wassermann and normal urine, there is then only one constant symptom left to look for—temperature rise and fall. It is as important that the temperature be recorded below normal as above. Some patients will vary from one to two degrees; all below the 98 3/5; and this below normal variation is a characteristic of tuberculosis. The ones whose temperature ranges high, suffer from mixed infections. It is understood that a patient with retinitis albuminurica may have a pulmonary tuberculous lesion and various other combinations can be thought of.

The use of tuberculin in diagnosis by causing a systemic reaction, as is generally recommended, may cause more injury than the original lesion. With the ophthalmoscope and small doses of tuberculin, the diagnosis can be as surely made and without the inconvenience and danger to the patient. The diagnosis of tuberculosis of the fundus is not established by a systemic reaction, if there is not a fundus change visible with the ophthalmoscope, or blurring of the vision. It is dangerous to give a large diagnostic dose of tuberculin in tubercular retinitis, or hemorrhage from either the retinal or choroidal vessels. Severe focal reactions may destroy already damaged nerve filaments. In hemorrhage caused by tuberculous erosion, it is safer to wait until nature has made some attempt to cure the process by clot organization than to seek for a tubercular reaction, which in this condition probably would cause increased hemorrhage. This is the important field for a close observation of the temperature curve. There is no other disease that produces the

same characteristic curve as tuberculosis. The temperature taken carefully for a week, with the blood examination, which is below normal in red blood corpuscles and hemoglobin, together with a negative Wassermann and urinalysis, permits us to arrive at the diagnosis of tubercular retinitis immediately.

The microscopic pathologic picture as seen with the ophthalmoscope: spots variable in number, one to as many as forty; white, small, large ones by confluence; lace-like edges; pigmentation slight or lying adjacent to lesion; edges not sharply defined in all lesions; retinal vessels intact, and passing over large spots; choroidal vessels not visible. Patient has not complained of pain, and loss of vision has come on slowly. In the cases to which I refer, the patients have the appearance of health and are attending to their usual affairs. The cases appended below may bring out the idea clearly.

TUBERCULOUS RETINITIS.

Miss M., age 45, business woman, had common diseases of childhood: "About the middle of August, 1915, I had an attack of cholera morbus, lasting for a couple of days. When I recovered, I noticed that I did not see so well." The first of September, 1915, consulted her oculist. He found several small spots in the right eye. Diognosis of choroiditis made. Potassium iodid prescribed. Middle of September, 1915, consulted an oculist in another city. He found spots in the right eye and prescribed her correction with the assurance that the correction of the error of vision was all that was needed. In October, consulted two oculists in St. Louis. With her correction, which was prescribed, vision was still normal. About this time, however, binocular vision began to be annoying. In February, 1916, consulted another oculist: vision at this time was 20/100 in the right eye with correction. From this until June, she consulted two other oculists. June 9, 1916, the patient consulted me. Right eye; area approximately the size of a disc in the lower, outer quadrant, posteriorly. A very small amount of pigment at the upper edge of the lesion. In the upper, outer quadrant there was from thirty to forty small white spots. Left eye; one small tubercle at about the equator, well forward in upper nasal quadrant. Vision at this time, with the right eye, was fingers at two feet with the eye rotated outward. Left eye, 20/20. During the following week, a Wassermann proved negative; the urine was all saved and examined chemically and microscopically every day; two blood counts were made during the week and the hemoglobin was 85; the red blood cells 3,280,000; whites 12,400; temperature varied from 96 to 99 degrees during the week. This patient was carrying on her business with no complaint about her general health, except a little tired. Undoubtedly in this case, a record of the temperature curve for one day would have at least pointed the way to the diagnosis. The suspected diagnosis of retinal tuberculosis was made positive. The patient ordered to take a year's rest in Colorado. On July 15, 1916, Dr. Edward Jackson saw this case in consultation and confirmed the diagnosis. Treatment and results follow: Rich food, exercise, rest and tuberculin. The dosage of tuberculin was followed and regulated entirely by the ophthalmoscopic findings, which follow in detail.

At this time the patient left to spend the winter in California. She was provided with a hypodermic and instructions to continue 1/100 mg. every two weeks.

10/25. Focal and local reaction.
11/ 1. Focal and local reaction.
11/15. Focal and local reaction.
11/29. Focal and local reaction.
12/13. Focal reaction.
12/27. Focal reaction.
1/10. Focal reaction slight.
1/24. Slight reaction.
2/ 7. Very slight reaction.
2/21. No reaction.
3/ 7. No reaction.
3/21. No reaction.
4/ 4. No reaction.
4/17. No reaction.

Patient was seen again on May 18, 1917. Both eyes were quiet. Vision:

right 20/200, International test charts 0.1.

CHORIO-RETINITIS.

Mrs. V. Age 23; apparently perfect health; one child; typhoid fever the only disease she ever had. Temperature range; five years after, fundus lesions appeared. Temperature taken for one week, three weeks ago, shows a range of one degree.

TUBERCULOSIS OF RETINAL ARTERY.

Male; age 25; weight 170; height five feet eleven inches; farmer; had just finished harvesting a large summer's crop. Negative Wassermann. Hemorrhage in right eye 9/18/15. Discharged 2/27/16. Temperature during the time varied usually about two degrees a day. Temperature chart appended was temperature range first week in June, 1917.

7.16 3/2500 mg.

7.20 3/2000 mg.

7.25 1/400 mg. Slight focal reaction, evidenced by slight blurring of vision. Ophthalmoscopically, a slight redness and swelling around the entire edge of the large spot. Marked at the upper extremity.

8.3 1/250 mg. Beginning 24 hours after the injection, a dimness of vision could be noticed by the patient and with the ophthalmoscope, redness around the edge of the larger area and a slight swelling around all the small tubercles. In the next thirteen injections, the same reaction could be seen around each tubercle.

8.8 1/250 mg. Same.

8.14 1/250 mg. Small arterial branches appearing in bottom of lesion.

8.21 1/250 mg. Small artery at outer edge of large lesion.

8.28 1/250 mg. Extension of artery at outer edge.

8.31 1/250 mg. Pink mesh of vessels in center of white area.

9.4 1/200 mg. Reaction more marked at periphery of lesion.

9.9 1/125 mg. Marked blurring of vision, redness around large area prominent, increase of fine branches from retinal artery. Increase of pink area in center of large lesion covering almost inner half.

9.11 1/125 mg. Same focal reaction as with previous injection. Appearance of very fine vessels at inner margin of large lesion extending about one-third across.

9.15 1/100 mg. Focal reaction same as previous. At this time, another vessel in center of lesion extending about one-half way up.

9.18 3/100 mg. Severe focal reaction evidenced by blurriness of vision, pinkness of almost entire area, as well as a marked local reaction.

9.23 3/100 mg. Severe local and focal reaction. Vision very blurry, and was now able to trace the vessel at the inner edge of the large lesion entirely across it.

9.30 1/100 mg. The dose was diminished on account of the severe reaction at the preceding injection.

10.11 1/100 mg. Mild focal reaction. The vessel in the center of the lesion can now be traced entirely across it. Three new vessels now across the lesion, in addition to the original arteries that crossed it.

	A. M.		P. M.	
Tuesday	6:00	97.2	9:15	98
Wednesday....	5:30	96.6	8:00	98
Thursday	...	...	8:30	97.8
Friday	6:30	97.6	6:00	98
Sunday	...	...	4:00	98.8
Monday	6:00	97	8:45	98.6
Tuesday	5:30	96.4	12:25	97.6
Wednesday....	...	...	9:30	98

TUBERCULOUS CHOROIDITIS: L. F.; age 27; hoisting engineer, and semi-professional baseball pitcher. Negative Wassermann, urine normal. For a few days scotoma; subretinal hemorrhage, came on while reading in the evening. Everything turned red; consulted me two days after. Following is a week's temperature chart:

3/ 8/17	3 P. M.	99
3/ 9/17	8 A. M.	97.6
	1 P. M.	98.4
	7 P. M.	98.6
3/10/17	8 A. M.	97.4
	1 P. M.	99.4
	8 P. M.	98.6
3/11/17	8 A. M.	98.6
	2 P. M.	99
	7 P. M.	98.8

3/12/17	8 A. M.	98.6
	1 P. M.	98.6
	5 P. M.	98.8
3/13/17	8 A. M.	98
	1 P. M.	99
	8 P. M.	98.6

Summary: 1. The temperature curve is the one fixed factor in tuberculous fundus lesions.

2. Tuberculin, for diagnostic purposes is useless if the ophthalmoscope does not show a focal reaction.

3. The dosage of tuberculin should be regulated by the ophthalmoscopic changes.

DISCUSSION.

C. N. Meader, Denver, Colorado. Dr. Smith's points with regard to the importance of the temperature curve are well taken, and they are especially true with regard to focal lesions of slight extent, as in the eye, where the temperature is relatively neglected but important. The tendency to a subnormal temperature beyond the range of the normal person is significant, and especially the labile temperature curve as though the temperature center were hypersensitive. One other point with regard to the temperature curve also is important, that is the tendency to a subnormal temperature in these slight tuberculous lesions, the tendency to a subnormal temperature brought on by exercise or fatigue. A great many of these patients will say that exercise does not tire them; yet on taking the temperature before and after exercise subnormal temperatures are recorded. I have been watching a few patients who are on graduated exercise, with that point in view, and have used this as a test as to whether exercise was beneficial or detrimental, and I believe this is a useful test as to the amount of exercise a given patient can stand. A patient with a suspicious eye lesion and who shows a temperature curve with a distinct tendency to subnormal or hypernormal after exercise is unquestionably a suspect. I was interested in the statement as to the likelihood of a temperature rise in ocular lesions. One would suspect that one would be unlikely to have a temperature rise from an ocular lesion. This might be explained on the basis of the relative vascularity of the eye and of the lungs. In these cases a thorough physical search would probably demonstrate a focus somewhere else, and also that the disease was not limited to the eye.

The question of large doses of tuberculin for diagnosis is important. The avoidance of large doses and of severe systemic reactions is of great importance in searching for a focus either in the lung, the body in general, or the eye; especially in the eye, in which so great damage may be done to delicate structures. In the process of giving tuberculin for a suspected lesion in the eye, we may quite unexpectedly clear up a systemic lesion which was not frank yet was interfering with the patient's efficiency.

I have in mind a patient whom I saw with Dr. Jackson. He had had both testicles removed nine years earlier for tuberculosis. He has long series of alternating cycles; some years of activity and some weeks of depression, inability to perform his tasks, mental or physical, with satisfaction. The question came up whether there was some effect on his adrenals from tuberculosis. Under tuberculin, not only his eye has partly cleared up, but he is free from his periods of depression, although there is no focus to be found elsewhere in the body, except a slight inactive focus in one apex.

Edward Jackson, Denver, Colorado. With reference to the main subject of the paper, the temperature, I feel that perhaps I have been neglectful. I have certainly not attempted to follow the temperature in these cases. I have had the feeling that probably the changes are so slight that unless the temperature is very carefully taken, and the conditions fairly well controlled under which the patient lives, and under which the temperature observations are made, we may get data that will be confusing rather than illuminating. We have to deal with a comparatively slight change of temperature, and to separate that from the normal daily variation may be puzzling. In the matter of local reactions we are in a better position to make accurate observations.

In some cases it is practically impossible to follow the changes closely, because of the amount of hemorrhage present. But there are a few cases in which it is possible to follow them very closely, and in these cases the focal reaction ought to be looked for carefully. In the case that Dr. Meader alluded to, at all times the retina has been open to inspection. There have been several small hemorrhages, but none that completely hid any part of the fundus. Yesterday the process of clearing up of the white spots in the retina which Dr. Smith has alluded to, which have been very marked in this case had made progress. These spots are located in the macular region; and suggested an albuminuric retinitis. They are distinctly clearer than they were ten days ago, and the patient's vision has risen to about 9/10 partly, better than it has been for the past year, or since the attack commenced.

In that case I have noticed slight evidences of reaction, not in these white spots in the macula, but in the vascular opacities along the upper vessels, in the region where the small hemorrhages have occurred. Coming back to the temperature, I have noticed in several patients that came as comparatively healthy young persons, that observing them closely they have ups and downs; there is anemia, perhaps, with fatigue from relatively moderate exertion, which is to

them overexertion. If we had watched closely the temperature changes we should probably have got from them important evidence.

C. A. Ringle, Greeley, Colorado. I am convinced that even a focal tuberculous lesion in the eye may be the cause of a severe temperature curve. Besides it is highly possible that we shall find in such cases a focal lesion elsewhere, and in all probability in the lungs.

H. H. Stark, El Paso, Texas. Regarding the temperature curve, I am very strongly impressed that it is one of the things necessary in making a diagnosis. Many of my cases examined by the lung specialist in the last few years have shown little or no activity. This was especially noticeable in a nurse I saw, in whom there was a corneal condition, with small opaque spots beginning at the limbus and gradually coming in toward the center of the cornea. Examination of her lungs showed no activity at all, but her temperature curve was decidedly noticeable, as showing a subnormal temperature in the morning and a rise in the afternoon. We need everything we can get in making our diagnosis of tuberculosis. I should like to know the experience of other men who have been doing the complement fixation test for tuberculosis. In only one case have I had a positive reaction, and in that case the condition proved not to be tuberculosis of the eye.

In a case in which the tuberculin had been gradually run up, the patient noticed a decided redness of the eye, which he had treated by the barber, with murine and hot towels. After the next dose of tuberculin he got an extremely severe reaction, the dose being three-thousandths of a milligram. Fortunately I succeeded in getting the pupil dilated, so that the eye came out very well, but the case was a decidedly severe one.

Otis Orendorff, Canon City, Colorado. The early diagnosis of any tuberculous lesion of the eye is extremely difficult, yet that is the time to make a diagnosis if we are to accomplish anything. The valuable point brought out in the paper with regard to diagnosis is that concerning subnormal temperature.

Harold Gifford, Omaha, Nebraska. We should not give up the idea that the patient has tuberculosis because we fail to get a reaction with tuberculin.

F. R. Spencer, Boulder, Colorado. Von Hippel has reported a case in which an eye that was tuberculous failed to give any reaction when the patient was given five mg. of tuberculin. I do not depend absolutely upon a tuberculin test, just as I do not depend absolutely upon a Wassermann test. We must be on our guard in these cases. Another point worth remembering is that in children the focus may be in the cervical lymph glands.

Marcus Feingold, New Orleans. Ever since the report of Stock we have been looking for causes of tubercular manifestations in the eye and in all cases of uveitis not manifestly due to other conditions such as lues, a search for tuberculosis was instituted with the aid of the internist. After observing pulse, temperature and respiration for several days a tuberculin injection was made. We have so far failed to get either a local or general reaction. Dullness in the lung, or distinct feathering, or a shadow at the hilus by the X-Ray, are not sufficient material upon which to base a diagnosis of retinal or ocular tuberculosis. We must remember that a great number of us who will die of other diseases and who have never had any manifestation of tuberculosis may actually have had this disease.

We must find an active tuberculosis if we are justly to conclude that the given eye condition may be possibly due to tuberculosis. Changes in the temperature, as have been brought out, and especially the lowering of the temperature after exercise, ought to be fairly valuable aids. As to retinal tuberculosis I must confess that none of the cases I suspected of being tubercular had any resemblance to those that I saw through the kindness of Dr. Jackson. Apparently your opportunities in Colorado to see ocular tuberculosis are greater than ours.

A CASE OF MASSIVE RETINAL EXUDATE.

MELVILLE BLACK, M. D., F. A. C. S.

DENVER, COLO.

Report of a case read before the Third Colorado Ophthalmological Congress, August 10th, 1917.

A most interesting case came under my care in November, 1915, through the courtesy of Dr. J. C. Strong of Leadville. The patient was a young Irishman aged 23 years. He was a metaliferous miner, of florid complexion and stocky build, and was as strong as an ox. He said his left eye had been bothering him a little all summer, and that about a month ago he put his hand over his right eye and found he could not see with the left. Four days ago

he was bending over at his work and when he stood up he could scarcely see with his right eye.

An ophthalmoscopic examination of the right fundus showed numerous hemorrhages throughout the temporal half of the retina. The disc had a slightly edematous appearance. The veins were engorged and looked very dark in color.

The left fundus presented the most remarkable appearance. At first glance it appeared as though the retina was extensively detached, but the retina had no movement. The next thought was that there was a growth under it. The whole nasal half of the retina and region of disc, which was entirely obscured, was seen best with a + 8.D lens in the ophthalmoscope. A little to the temporal side of the median line the retinal level plunged suddenly down, like a precipice, to a plane below in the macular region. This lower level was hazy and no retinal details could be made out. The elevated plane gave the appearance of a mountain of exudate in which blood vessels ran in a most irregular manner. They would appear on the surface and dip again out of sight. At the rim of this swelling the vessels were numerous and small, and in places formed a tangle, part of which appeared projected free into the vitreous.

The hemorrhages in the retina of the right eye underwent constant change and very shortly the nasal side of the retina became edematous, the normal vessels obscured and the optic disc partially obscured and the level of this region was elevated. New vessels began to form and in the course of a few months time the appearance of the right eye resembled very closely that of the left.

The vision of the left eye when I first saw him was almost nil, the vision of the right eye was 20/30, but it gradually got worse and worse until in six months it was 2/200.

This case was seen frequently by a number of gentlemen present at this meeting. Several of us felt that the process was tuberculous, and working upon that hypothesis he was given tuberculin during the entire period of six months that he was under my care. It was possible to produce a general and focal reaction at any time by giving a large enough dose. In addition to the tuberculin he was given large doses of iodin in the form of iodopin hypodermatically. He was also given mercury by inunction. Early in the treatment he was given strychnia and 2 gr. calomel twice a week. This treatment was largely empirical because the extensive laboratory work done on this case revealed nothing that could be assigned as a positive cause unless it was tuberculosis.

In addition to this, his teeth, which were usually good, were cleaned and put in good shape. His nose and accessory sinuses were examined and radiographed with negative results.

After being under our observation here for six months he went to New York and I have lost track of him since then. It was a most interesting experience to see the same condition gradually develop in his right eye that had already reached its height in the left. It was also quite difficult to understand why an apparently healthy, robust young man, free from luetic taint, should develop such a formidable disease first in one eye and then in the other. The selective tendency of the process to attack the retina, and that the nasal halves of each should have been chosen as the sites for the massive exudate also seems rather remarkable.

DISCUSSION.

HAROLD GIFFORD, Omaha, Nebraska. There has been at least one case of Coats' massive exudate of the retina which was mistaken for glioma; really thus representing a form of socalled pseudoglioma.

DISTURBANCES OF VISION IN PATIENTS HARBORING CERTAIN FILARIAL TUMORS.

PACHECO LUNA, M. D.

GAUTEMALA, C. A.

Professor Luna in this preliminary paper calls attention to an extremely interesting form of ocular disease apparently dependent on the presence in the body of a special filarial parasite. Translated from the Spanish for this journal.

To my good colleague and friend, Dr. Rudolph Robles, I owe the opportunity of having been able to study in more than one hundred individuals the ocular disturbances which appear in persons attacked by the disease commonly known by the name, "Coast Erysipelas," which is very prevalent in certain regions of this republic.

Dr. Robles is the first among us, and probably on the American Continent, who has interested himself in this epidemic, which greatly endangers the vision. He has discovered that the cause of coast erysipelas is a parasite, and also the intimate relation between the organism mentioned and the symptoms which manifest themselves in the individual who carries it. The parasite is not perfectly studied, but it is a filaria, which seems to be of the genus, **Onchocerca** (and at one time must have been imported from Africa), and the species **Onchocerca volvulus.** Leuckart, 1893.

The doubts which prevent it from being included definitely in the species named, rise out of some difference in certain zoologic characters; and because of the fact that none of the European authors mention in their descriptions, the ocular symptoms observed by us, and which have been really the most important in our patients, and they have not been reported from the studies made in the infected regions in Africa.

However, whether the parasite is of the species named or of another, I shall deal only with the notes concerning the visual disturbances which I have met with among the carriers of this filaria, observed by me in Guatemala, and which I shall call onchocercosis, in order not to confuse them with those which underlie the well known diseases called by the names of filariasis, dracunculosis, volvulosis, etc. These points are entirely preliminary, without any pretense to definiteness, much less completeness, and are subject, consequently, to change when the observations have been extended to a greater number of cases, or when the studies of other physicians clear up many uncertainties.

CLASSIFICATION AND DIVISION.

Taking the clinical symptoms as the basis of my classification, I will first divide the forms which I have noted into two classes.

The first I will call normal or regular, because the cases included under it are those which appear most frequently, and seem to be the more or less advanced stages of a slow and progressive course, which in the majority of those infected, lead me to believe that they are in direct ratio to the age of the infection.

I will designate the second by the the term, abnormal or exceptional, on account of its being very rare and differing from the former in regard to its objective symptoms.

NORMAL OR REGULAR FORM. FIRST OR ACUTE PERIOD.

The patient experiences a feeling of dryness of the conjunctiva in both eyes, a smarting pain without vascular injection. In a few days, a very intense photophobia is established, by reason of which he shuns the light, shielding and covering his eyes with his hands,

or turning his back to the light. The pupil is contracted to the utmost. The patient begins to complain that he sees badly, sees worse, sees objects as if in a mist, and finally distinguishes only shadows.

At this stage, an objective examination demonstrates a lack of conjunctival and ciliary injection. The cornea is invaded from the periphery toward the center, predominating in the part disclosed in the palpebral fissure, by very small, dot-like, whitish, superficial infiltrations (Fig 1). These infiltrations are not elevated, although situated in the epithelial layer; some are so fine that they may pass unnoticed if not examined by oblique reflection and increasing the image by means of a lens or corneal microscope. Iris normal. Ophthalmoscopic examination negative.

We are dealing, then, with a superficial, chronic keratitis punctata, which recalls to my mind the superficial keratitis punctata described by Fuchs in 1889, whose etiology at that time and even today, it has not been possible to explain. The keratitis mentioned has also been described by the names of central, subepithelial keratitis, by Adler; macular keratitis, by Reuss; and by others by the names of superficial keratitis, nodule of the cornea, etc. The course is rapid; it arrives at this stage in a few days. I have the case of a child five months old, who presents the picture of the final stage; and in whom, according to the mother, the first signs appeared two months after birth. The lesions described run a chronic course, lasting for years, and diminishing with time; but they do not disappear entirely. In all the cases in which the cornea has been concerned, there remain permanent infiltrations, which lessen the visual acuteness.

Before proceeding further, and in order to finish with this picture, permit me to illustrate the point by means of one of my own observations, which is most interesting, because that of an intelligent and educated person, who gives a perfect account of what happened, and answers questions satisfactorily. It is concerning the manager of a firm in the zone of Yepocapa, who has discharged this office for fifteen months, and who lived before in the United States of Colombia. Age, 36 years. Malaria formerly. Eyesight normal until four months previously, at which time he believed he had a disease of the eyes, mild at first, but which increased in intensity, photophobia predominating. In short, his sight was affected until he could no longer read, and could see only shadows. He came here and consulted an optician, who referred him to a physician as not being a matter of his specialty; my colleague allayed the pain by prescribing an eyewash of adrenalin-cocain, but not experiencing relief, the patient decided to consult me.

I found photophobia; the patient could not endure light; he covered his eyes with his hands, turned his back, and it was not possible to examine his eyes in the consulting room. In the dark room with oblique illumination, I succeeded in overcoming the tonic blepharospasm and seeing the eye imperfectly. Bilateral lesions, absence of secretion, lacrimation, and conjunctival and ciliary injection. Corneas transparent. They permit the examination of the iris and the fundus of the eye; but they are irregularly adorned by dot-like, opaline infiltrations, most of them not so large as half the diameter of a pinhead, superficial, of the epithelium, not elevated, more abundant in the periphery and the number greater in the horizontal diameter, no vascularization or ulceration. Iris shows changes in color, which seem to be due to the changes in the cornea. The pupils are contracted, but they react to light and convergence. Tension normal.

I assured him that the lesions were those of the onchocercosis, and then he told me that there were many eye troubles in the zone, asking me whether a small tumor on the neck might not be that of the filariasis. At that time, my experience was only of four cases of superficial keratitis punctata onchocercosa, already treated, and I was not familiar with the tumors. Therefore I sent him to Dr. Robles, who extracted

the tumor on the day following, and showed me the filaria.

ABNORMAL OR EXCEPTIONAL FORM.

The first stage of the chronic condition is a continuation of the former; the keratitis, and consequently the photophobia have diminished, but have not disappeared entirely, and the visual acuteness has lessened to such a degree

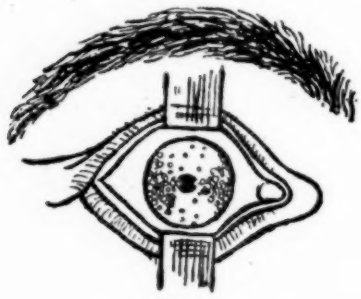


FIG. 1.

Early stage of usual form. Superficial corneal infiltrations of different sizes, mostly near the horizontal diameter and limbus. Pupil contracted. (Pacheco Luna).

that the patients can perceive only shadows at a short distance. The iris has a dirty tint and the delineation is rough; the pupils regularly contracted, react neither to light nor convergence, and the iris adheres by the free edge to the anterior surface of the crystallin lens. Mydriatics do not dilate them (Fig. 1). The pupillary seclusion is not shown by ballooning of the iris and increase of tension, but the iris remains smooth and stretched. The pupils are clear, do not develop false pupillary membranes, and where the corneas permit it, the fundus of the eye can be illuminated, and does not present any appreciable change. We seem to be dealing, then, with a special, chronic, fibrinous iritis of a slow and insidious course. The disturbances of this kind are numerous, but always subject to the first group, and amaurotics are not observed.

THIRD PERIOD, OR SECOND STAGE OF THE CHRONIC CONDITION.

Although I do not possess a sufficient number of observations to decide whether the manifestations of the onchocercosis which I include here, are really the evolution of the chronic form or another special form, the symptoms which I am going to enumerate have been found by me only in old chronic cases, and I am inclined to suspend judgment until new observations prove it.

The infection at this period dates for many months. On some occasions, it is so old that the tumors have disappeared. The blind are numerous, and those who are not blind are so far on the road, that we can affirm that the course is toward that condition. The picture which the few onchocercotics here collected presents is very different from those we have described. There are amblyopias, in which the patients experience a certain photophobia. In all is noted an absolute absence of an acute process.

The superficial keratitis punctata has the peculiarity of presenting the greatest number of elements in the lower half of the cornea, the latter increasing in the proximity to the lowest point of the limbus, being sometimes so close that they form a uniform, diffuse infiltration resembling ground glass.

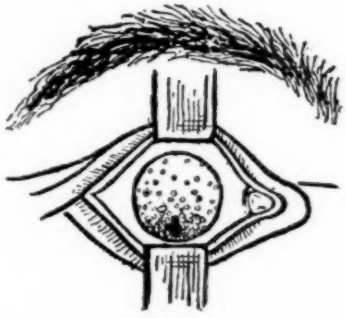


FIG. 2.

Later stage of chronic superficial keratitis punctata. Infiltrations chiefly in lower part of cornea. Fibrinous iritis. Pupil drawn down almost to lower limbus, an irregular vertical oval. (Pacheco Luna).

The iris appears smooth, the part above the pupil stretched; the part below the pupil adhering, and applied to the crystallin lens (Fig. 2). The pupil occupies the lower half of the anterior segment, the latter turning down, and in some very old cases, even touching the corneal limbus. Its form is irregular, the greatest diameter vertical. It

does not react, and seems to be dilated in a small space when a mydriatic is instilled. In the cases of complete blindness, a false membrane hides the pupil. On withdrawing this, the pupil is found to be reduced to a point or obliterated. In this case, its place alone is recognized by a slight, almost imperceptible umbilication. The pathogenesis of so singular a deviation might be explained by a process of fibrinous iritis, in which there is no pupillary retraction, and in which, by reason of its weight, the fibrin descends and causes it to adhere to the part of the iris which is beneath the pupil and the anterior surface of the crystallin lens, the rest of the iris remaining free, and the fibrin on being retracted, deflects the iris downward.

During the time that Dr. Domingo Alvarez was chief of the Eye Department of the General Hospital, a dozen of these patients had eye operations. The result of these interventions is curious and interesting. They see less and are blind on the side operated upon. The visual acuteness of the other eye is better in spite of the fact that in some, the openings which have been cleared are large, and the media transparent. This fact shows that the diminution of the visual acuteness is not due so much to an obstacle in the media of the eye, which hinders the passage of light rays, as to a change inappreciable to our means of investigation. Proofs of this are the patients which correspond to the picture yet to be described, and which I will explain further on.

ABNORMAL OR EXCEPTIONAL COURSE.

The objective lesions of the eyes are not distinguished. They present, nevertheless, photophobia and diminution of visual acuteness. Among them are some recently affected, and others of much longer duration. A person of this class saw so little that a guide led him. He was operated upon, and the following morning walked alone and saw perfectly. The visual acuteness had increased so much that he who had to be led on the day before, could now distinguish the horizon at a distance of many kilometers. A German without objective ocular symptoms boasted that he saw perfectly, nevertheless his visual acuity was 0.7. It was necessary to extract the tumors in order to convince him of this diminution. He then declared that he saw much better. A lady of high social rank had to consult an optician because her sight suffered increase and decrease of visual acuteness with irregular alternations. As he could not improve it, he suggested that she had a fissure in the retina, and should go to the United States immediately, or she would lose her sight. In New Orleans, Dr. Feingold, the famous oculist of the South, examined her a week after, gave the authoritative opinion that she did not have a disease of the fundus of the eye, but that he was dealing with a defect of refraction which could be corrected by lenses. She went at once to New York, where Knapp saw her, and he also affirmed that there existed no lesion of the eye, and that she needed proper glasses. The lady returned without having obtained any improvement, and this caused her much anxiety, until I extracted a filarial tumor, which she had had for a long time, and which was situated near the end of the right eyebrow.

In a general way, the lesions described, however different they may appear to be, have something in common. They appear in the onchocercotic, all of whom suffer disturbances of vision; the lesions are lasting, do not decrease, seem to be progressive and chronic, and the visual acuteness increases considerably and rapidly only when the tumors are extracted. For this reason, it is presumed that all the symptoms are due to the secretion from a parasite in the human organism, of a toxic substance, which produces at times appreciable lesions in the eyes, and at others, lesions inappreciable by our means of investigation.

THE ANTIGENIC PROPERTIES OF UVEAL TISSUE AS SHOWN BY COMPLEMENT FIXATION

ALAN C. WOODS, M. D.

PHILADELPHIA.

Abstract from The Archives of Ophthalmology, vol. 46, p. 503, by William F. Hardy, M. D.

The studies of Alan C. Woods of Philadelphia relative to ocular anaphylaxis have profound scientific importance. The previous papers dealt with the anaphylactic theory of sympathetic ophthalmia; the experiments described therein showed that the pigment of uveal tissue possessed the antigenic properties necessary to make the anaphylactic theory of sympathetic ophthalmia a scientific study. In its anaphylactic reactions, pigment acted as a foreign protein, an antigen, in animals of the same species; it was organ specific and not species specific.

Elschnig reached the same general conclusions. Certain phases of his work have been confirmed, but not his fundamental observations as a whole. A historical sketch of Elschnig's work is given together with his conclusion that uveal tissue could act as antigen in the same species of animal, and that the pigment was the constituent of uvea responsible for this. An additional point shown by Elschnig was that the fixation of complement by uvea and pigment immune sera, with uvea and pigment antigens, was due to the insoluble portions, pigment, in the antigen suspensions.

Woods explains his experimental technic and points out the chief pitfall in experimental complement fixation in dogs and rabbits, which is nonspecific fixation. Antigens of cows' uvea and pigment, and of dogs' uvea and pigment were used. The results of the work are shown in tabular form. The antigens were not of equal value. The alcoholic extract of uvea appeared to be without antigenic properties and was abandoned. On the whole, the two best antigens were the emulsion of uvea in salt solution, and the suspension of unheated pigment in salt solution. The results shown in the first table demonstrated two points:

(1) That uveal emulsion possesses the ordinary antigenic properties of protein, and (2) The uveal pigment possesses also the same common antigenic properties.

Table II illustrates not only the property of uveal tissue to act as antigen in the homologous animal, but shows also that the pigment is responsible for this property. This substantiates Elschnig's findings.

Table III illustrates the organ specific properties. The sera of animals immunized to uvea fix complement with any uvea antigen, regardless of species. Pigment acts likewise, and it is probably due to the pigment content that uveal tissue owes this antigenic property. This again confirms Elschnig.

With Woods, the sera of animals immunized to whole uvea were species specific, and although from his work with complement fixation he could not definitely state that uveal pigment is not species specific, he is inclined to that view. It seems certain that practically all the fixation of complement shown by immune sera with uvea and pigment antigens is due to the constituents, chiefly pigment, suspended in the antigens.

The relative value of antigens is held to be a point of clinical interest. Some observers have claimed that the sera of patients with sympathetic ophthalmia will give fixation of complement with uvea and pigment antigens. The truth of this has not been established. If ex-

isting or threatened sympathetic ophthalmia can be detected by this means, it is of great interest and importance. For this work the best antigens are the fresh salt solution, suspension of cows' uveal emulsion and cows' unheated pigment, used in one-third, or one-half, the anticomplementary dose. If but one antigen is used, the emulsion of the whole uvea is to be preferred. In the author's hands, cow antigens have given the best results and are the easiest obtained.

The summary is as follows: "Dogs have been immunized to emulsions of foreign and homologous uvea, and to foreign and homologous uveal pigment. The complement fixation properties of these sera have been studied in order to verify the similar work of Elschnig, and more firmly establish the points assumed by the anaphylactic theory of sympathetic ophthalmia. Emulsions of whole uvea and uveal pigment possess ordinary antigenic properties. Moreover they are capable of acting as antigens in the homologous animal, and the pigment is the constituent of uveal tissue responsible for this property. In its immunologic reactions, uveal pigment is organ specific and not species specific.

"The best antigens for fixing complement with immune sera are fresh salt solution emulsions of whole uvea, and fresh salt solution suspensions of unheated pigment. The fixation properties of these antigens are due to the insoluble constituents suspended in the salt solution menstrum." A careful reading of the original article is recommended especially for the correct appreciation of the tables accompanying the text.

SHORT ABSTRACTS.

Under this heading are included notices of the most important points of interest that appear in the recent literature which are capable of brief statement. For the systematic review of the whole literature of each subject the reader must consult the "Digest of the Literature," a part of which appears in each number of the journal, and which will be complete within the year. The initials appended to each abstract are those of the collaborator who made the abstract; abstracts made by foreign collaborators or by contributors whose names are not published in the list of collaborators are signed with the abstractor's name.

Dor, L. Retrobulbar Optic Neuritides. (La Clinique Ophtalmologique, May 1917.) This is a most extreme article upon the etiology of the above mentioned condition. The author maintains that nineteen out of twenty cases of retrobulbar neuritis follow a slow periostitis at the root of the bicuspid teeth of the superior maxilla. This periostitis is frequently complicated by radiculo-dentigerous cysts, and fistulae. Pivots, gold crowns, or particles of root remaining after extraction may cause the inflammation. Besides producing the neuritis, Dor insists that many detachments of the retina, venous thromboses, hemorrhages, embolisms, choroiditis, iritis, keratitis and even cataracts have their origin in the bicuspids. Of course there are some other causes in a few cases. In simple accommodation asthenopia of several weeks' duration, always suspect the teeth and guard against more serious conditions later. J. S. W.

Jocqs, R. Retrobulbar Neuritis and Insular Sclerosis. (La Clinique Ophtalmologique, May, 1917. J. believes that multiple sclerosis is the most frequent cause of acute retrobulbar neuritis which is so early a symptom that the causative factor is not recognized. Fleischer has collected thirty cases. Often spontaneous recovery occurs, due to the regeneration of the broken nerve fibers and the cessation of the inflammatory edema. This is followed by a functional recovery although anatomically the lesion is still present. The signs of a retrobulbar neuritis which should cause a suspicion as to the etiology, are mentioned. Individuals between seventeen and thirty years are

most often affected. A unilateral onset is almost constant. The sensation of a veil before the eye with headaches usually usher in the disease and this is followed by a central scotoma much larger than is found in a toxic amblyopia and this scotoma becomes absolute in many patients. The fundus is usually negative, occasionally a slight hyperemia of the disk. The duration is never longer than eight weeks and the general nervous symptoms may not follow for many years. J. S. W.

Lapersonne, F. de. Premature Enucleations in Base Hospitals. (Archives d'Ophtalmologie, v. 35, No. 11, p. 449.) The oculists at the base hospitals have frequently protested against the premature enucleations practised in field hospitals. It is rare that an eye has to be removed within twenty-four or forty-eight hours after a wound, and when this has been done it has frequently been the case that the tissues were badly slashed, foreign bodies and splinters of bone often left in the orbit, causing interminable suppurations, and leading to the formation of cicatrices which made the wearing of a prothesis almost impossible. Worse yet is the enucleation of both eyes, thus depriving the unfortunate soldier of all possibility of ever seeing again. The author cites a number of cases which were brought in after double enucleation, all of which were operated on either on the day they were wounded or within forty-eight hours, some of them having been seen to in a large ambulance at the front, the staff of which consisted of seventeen surgeons without a single oculist. There is no excuse for this undue haste, as the hemorrhage is never dangerous, panophthalmitis does not set in immediately, and the spreading of an infection to the meninges is certainly not prevented by a hasty enucleation; on the contrary, it is a fact that in deep wounds of the orbit with escape of cephalo-rachidian fluid enucleation is disastrous.

On the other hand some sight has been saved to eyes which seemed lost. If blindness is unavoidable it is much better that the wounded should be prepared for their loss gradually, and not subjected to such a terrible privation at a time when their moral and physical conditions are at their worst.

M. W. F.

Young, George. Macular Perception in Advanced Cataract. (Brit Jour. of Ophth., June, 1917.) The writer points out the difficulty in estimating whether the macula is sound when deciding to operate upon mature senile cataract. He describes two methods of deciding this point: He places a blackened disc with 0.2 mm. perforation in front of the test eye, 5 mm. in front of the cornea; this yields a retinal image of 0.3 mm.; in the dark room the light from an electric ophthalmoscope is brought close to the hole; the patient is told to fix the luminous dot and the disc is gradually removed as far as possible from the cornea to reduce the size of the retinal image; fixation must be maintained; sometimes the hole must be enlarged.

Another and more certain test is the following: He uses three discs, perforated by two, three, and four holes respectively, within a central area of less than 3mm. Placing them successively in the frame he approaches the eye as near as possible to the frosted focus light behind the largest aperture of the Thorington chimney. The patient is told to "look for the moon," and states, without hesitation or error, when two, three, or four moons are seen, pointing out their relative position, which is constantly changed by rotating the discs. The two-hole disc seemed to be most useful, each hand being used to follow the movements of the moons. C. H. M.

SOCIETY PROCEEDINGS.

SOUTHERN MEDICAL ASSOCIATION—SECTION ON OPHTHALMOLOGY.

ELEVENTH ANNUAL MEETING,

Memphis, Tenn., Nov. 12-15, 1917.

DR. THOMAS W. MOORE, Chairman.

Ophthalmoscope, Retinoscope and Pupillary Disc in Refraction.

DR. ALBERT H. MASON, Waycross, Ga., showed a diagram to represent the front of the eye. The rays of light that pass through the periphery of the lens are brought to a focus sooner than those passing through the center. This is called spheric aberration. In a normal state, the eye does not allow the rays to pass through the whole lens, but only through an area two millimeters in every direction from the pole. The area through which the peripheral rays pass is three times the area of the normal pupil. The peripheral rays being in the majority, refraction of an eye without cutting these rays out does not correct the refractive error of the central portion. One should employ, in refraction work as regularly as one uses a cycloplegic, some instrument that will exclude the peripheral rays. The author's pupillary disc allows only a pencil of light equal to the diameter of the pupil to enter the eye.

DISCUSSION.—Dr. Robert Fagin, Memphis, Tenn.: I see that this instrument would be a good thing, although I have not tried it. Anything that will eliminate the peripheral rays will make it easier to get the proper correction. I put little faith in the ophthalmometer. Low degrees of astigmatism are hard to measure with the ophthalmoscope. I rely on the retinoscope almost entirely. I always use a cycloplegic up to the age of forty-five years, and sparingly afterwards. I always try to get the central rays, and not the peripheral.

Dr. George W. Price, Nashville, Tenn.: I think that this diagram is misleading. If it were even approximately correct, every patient would suffer from spheric aberration; but this is not so, even in many in whom the pupillary space has been almost obliterated. The lines which pass through the peripheral portion of the lens would cover nothing like the space indicated by the drawing. Otherwise, we should have dispersion circles in almost every case of defect in vision; and, when using a cycloplegic, the patient would have a color refraction that would give a ring just around the light. So far as the use of the pupillary disc is concerned, I would not interpose any objection. Dr. Mason has presented to us an idea that is worthy of very careful consideration. That our subjective refraction work with the dilated pupil and with the normal pupil should be synchronous, is an idea that never occurred to me, until the appearance of Dr. Mason's first paper. The question of the ophthalmometer should not enter into the discussion, because Dr. Mason only mentioned it incidentally.

Dr. Mason, closing: I believe that we are right in assuming that any ray of light that passes through the refractive media of the eye and does not pass through the three, four or five millimeters of pupil that we have to start with, is a peripheral ray. That being true, we have not been refracting our patients with absolute correctness. When I first began using the little disc to correct spheric aberration, I took ten cases and refracted them with and without the disc. The results proved to me that in doing refraction, if we attempt to correct every bit of the hypermetropia present, using this little

device. or something else that will cut down the peripheral rays; and give our patients glasses that are a little stronger, they will be able to wear them comfortably. If you wish to get something that will answer the purpose of this disc, you may, for a small sum, get a black disc, something like a pin-hole disc, in which you can have a four millimeter opening made. Use it in the trial frame; and try first refracting with this, and then without. Then you will see for yourselves the difference in the results you obtain.

Removal of Foreign Bodies from Eyeball and Orbit.

DR. DUNBAR ROY, Atlanta, Ga., said: I have five cases to report. By the aid of patience and perseverance, we are frequently able to bring about a happy result in these cases. The first case is interesting as showing what may be accomplished in an eye that seemingly has been entirely destroyed. A piece of steel had cut through the cornea and lodged in the anterior chamber. The accident occurred in 1913. The man is still able to work and make a comfortable living. We should give every injured eye prolonged and careful treatment before resorting to enucleation.

In the second case, a piece of brass passed into the eye and lodged between the iris and cornea, deep down in the anterior chamber. It could be seen only when the patient looked down. For fear of causing peripheral separation of the iris by catching the foreign body and pulling the iris at the same time, I devised the plan of catching the pupillary margin of the iris and stretching it almost up to the upper border. This brought the particle of brass in front of the cut that had been made; and my assistant picked it out without trouble. You can pull the iris away in any direction, on account of its elasticity. The eye has now a vision of 20/40, with one or two opacities in the lens.

I shall merely mention the third case, which was one of injury by shot, because there are others that I wish to speak of in more detail. I have the plate showing the localization of the shot, which was also localized by the technic that aided us in getting at the foreign body. We found this shot, which had entered through the side, between the eye and the orbital margin and passed inward. It looked as if the foreign body were inside the eye, and yet it was localized by the radiologist as being close to the tunics of the eyeball. I first attempted to go in and see whether it was not in the orbit, but could not reach it. I then enucleated the eye, and found that half of the shot was protruding into the posterior chamber, and half was outside.

Case five was of unusual interest. The patient was struck by a bird shot and it was thought that it had struck the eye, but had not penetrated it. The local physician probed, but discovered nothing. The X-ray showed the foreign body outside the eyeball, in the orbital cavity. It was removed, and the patient made a good recovery. Five months later there were no signs of a scar; the muscle balance was normal and the vision 20/40, which it still remains. If it had not been for the X-ray we should have concluded that no foreign body was present. There were no signs of conjunctival laceration. I probed far back before making the X-ray, and could not discover anything. This case is also unique in that the shot passed around between the two membranes. It made a rent in the conjunctiva and struck the sclera, which deflected it.

The management of foreign bodies requires good judgment, supplemented with clinical experience. Since writing this paper, I have had another case with the shot half way into the eye. I had to enucleate the eye.

DISCUSSION.—Dr. Marcus Feingold, New Orleans, La.: We must acknowledge that factors we cannot account for enter into the lucky or unlucky outcome in these cases. To remove every foreign body that enters the eye may not be so good a procedure as one might think, especially in the case of a bird shot. In New Orleans, we do not enter the eyeball in search of the bullet, unless it actually presents itself. As to the question of sympathetic oph-

thalmia, I incline to the view that there is very little to fear from it. For that reason, we have not been more radical in advocating enucleation.

Dr. H. H. Martin, Savannah, Ga.: I wish to emphasize what has been said about conservative surgery of the eye. With our greater understanding of asepsis at the present day, we can wait much later before resorting to enucleation than we could formerly, with the fear of sympathetic ophthalmia before us. The greatest injury that results from foreign bodies in the eye is infection, and the longer the body remains, the greater is the liability to infection. Therefore, I prefer the use of the hand magnet to that of the more powerful one. The latter requires delay, while the hand magnet can be used within a few minutes. When foreign bodies that are not magnetic are inside the eyeball, they had best be left alone, unless they can be easily removed with forceps, until enucleation is demanded.

Dr. Frank D. Boyd, Forth Worth, Tex.: I wish to report a case of mistake in diagnosis, in the case of a gentleman about thirty years of age. The case looked like one of interstitial keratitis. The history was negative. We kept him under treatment for quite a while. Within ten days or two weeks the eye began to clear up, and I saw in the anterior chamber what was apparently a bright piece of glass. It was easily delivered. The patient then said he remembered that when he was a boy, he had put some powder in a bottle and blown it up. One of the fragments must have gone into the eyeball. It must have been there for nearly twenty-five years. It had given no trouble until a few days before I saw him. He recovered and had normal vision.

Dr. George H. Price: I believe that in cases in which a piece of brass is lodged on the anterior surface of the iris, it will remain there for a long time without giving trouble, just as the piece of glass did in the case mentioned by Dr. Boyd. I have seen a piece that had been there twenty years. When we have removed the foreign body, we have not always escaped trouble. Most foreign bodies carry with them an infectious agent. If a piece of steel comes from a clean chisel, or from a hammer head that has been struck forcibly enough to sterilize it by heat, you do not have the reaction; but if the piece of steel or iron comes from the gear of a car, locomotive or other vehicle, the chances are that you are going to have pus in the eye, even though the foreign body be removed.

Dr. John O. McReynolds, Dallas, Tex.: The danger of sympathetic ophthalmia is not eliminated by virtue of the presence or absence of any particular kind of foreign body. It is the inflammatory reaction following the injury that determines whether you will have the development of sympathetic ophthalmia. It develops from punctured wounds, and not from foreign bodies, so that the mere fact that a foreign body has been removed does not release us from solicitude concerning the case. If, at the end of ten days, no inflammatory reaction has taken place, we may know that the eye is tolerating the foreign body well. We do not have sympathetic ophthalmia unless there is an iridocyclitis, which precedes every case of sympathetic ophthalmia.

Tumors of the Lacrimal Gland.

Dr. Adolph O. Pfingst, Louisville, Ky. A farmer of forty-eight years applied to me for treatment a year and a half ago, with the history that his left eye had been deviating downward and somewhat outward, and protruding, for a year and a half. On examination, I found half an inch of deviation downward. Rotation was limited upward and outward. The eye showed a good deal of trouble around the disc and some distensions of the veins. His vision had been reduced to 20/200. On palpating the orbit above the eye, we found a mass between the eyeball and the orbital roof, as far as the little finger would reach. On putting the finger to the nasal side, the growth extended out to the external side of the internal angular process. It felt like a mucocele growing down from the frontal sinus. The diagno-

sis of lacrimal gland tumor was made, and operation suggested and carried out, under a general anesthetic. An incision was made through the eyebrow at the orbital edge, going through the middle of the orbit and out to the external angular process; and the growth was dissected out. It could readily be peeled out, although it extended far back in the orbit. It was half an inch long and weighed three and one-half drams. The wound healed readily, but there remained quite a good deal of ptosis. Later, however, the eye had lifted perfectly. The tumor had a white fibrous capsule. Histologically, the tumor resembled tumors of the salivary gland. The interesting feature of the case is that it was a benign growth of mixed tissue, with no tendency to metastasis. These growths cause death by pressure.

Traumatic Intraocular Hemorrhage.

Dr. W. G. HARRISON, Birmingham, Ala., reported some clinical observations with especial reference to prognosis and treatment. Cases of traumatic intraocular hemorrhage show that the prognosis is very favorable, even when the condition occurs late in life. There is a great variety of opinion as to the efficacy of various measures in the treatment.

Infection After Elliot Operation Not Always Fatal to Eye.

DR. MARCUS FEINGOLD, New Orleans, La. In the first case, a typical picture of panophthalmitis developed. It gradually cleared away, the media became perfectly clear, and no change in the fundus could be seen. The tension was raised slightly. In the second case, a patient with a blind eye was operated on. Four years later, he had inflammation in both eyes. Culture showed *Ameba coli* and *Staphylococcus albus*. A week later, the hypopyon was gone and the media had become clear. He entirely recovered later. Tension plus.

I have compiled a table of cases comprising twenty-four cures, and thirty-one in which the eyes were lost. These teach that late infection need not always end fatally to the eye. It must be remembered, however, that the figures are incomplete, and that the percentage of cures, if calculated from these figures, would appear to be higher than it would be if we had all the cases. The two cases reported, as well as several instances in the literature, indicate that late infection makes the scar firmer. No statistics can be compiled; and, therefore, no explanation given for the different varieties of late infection manifested in different cases.

Retino-Choroiditis Juxtapapillaris.

DR. H. H. MARTIN, Savannah, Ga. Nine males and eight females, of varying ages, were studied. All were well situated economically. Each complained of nebulous vision. Only four complained of pain in the ciliary body. In two of these, iritis was actually present. In thirteen cases, the external eye looked normal. In every case there were opacities in the vitreous. In nine patients the site was exclusively beside the papilla. In every case the papilla was normal. The author believes that the defect originates in the nerve fibers, as the result of their obstruction by inflammation. He isolates four types of these defects. A relapse does not modify the original defect. Every case relapses or will relapse in time. A single acute attack lasts from one month to four months.

The prognosis is good, in a way. The patient sees normally. He still has a field defect, and is sure some time to relapse. The treatment is rest in bed and aspirin. Latent tuberculosis looms up prominently as a cause. For the destruction of nerve fibers, this disease would have to be so extreme that no examination of the eyegrounds would be possible. Enucleation would be a necessity. Not a single patient showed any evidence of tuberculosis, or even of a family taint. No tuberculin tests, however, were made.

The author believes that the problems of the disease are important to solve, and hopes that others will interest themselves in it. He maintains that the name now given it should not be retained, because the inflammation may be in the periphery. He would

term it Jensen's disease. He thinks that infection of some sort is responsible; and that the retina, especially near the papilla is especially sensitive to this infection. One should examine the visual field in every case of choroiditis, especially near the papilla. In his case, the inflammatory focus was central and single, began in the deeper layers, was sharply limited and appeared to follow the course described by Jensen, and the cloudiness of the vitreous persisted long after the inflammation had begun to subside under treatment. Repeated Wassermann tests were negative. The choroidal disease was secondary to the retinal. He wishes to emphasize the necessity for examination of the papilla in every case of retinal and choroidal disease. All possible focal infection should be eliminated.

Discussion.—Dr. John Green, Jr., St. Louis, Mo.: It would appear that the name Jensen's retinitis or retinochoroiditis does not convey to all minds exactly the same clinical picture. Some authors (our essayist included), would limit the appellation strictly to juxtapapillary lesions, presenting the typical field defect. Others do not insist that the lesion shall have this situation, and accept as examples of this disease cases of retino-choroiditis in which the lesion is away from the disc, or even peripheral.

It seems probable that the disease may be regarded as a definite clinical entity; it it pursues a well defined course and produces a typical defect in the visual field. There is no reason why solitary choroidal lesions of syphilitic or tubercular origin should not occupy a position adjacent to the papilla, and thus simulate Jensen's retinitis. A careful examination of the field may then be the only means of differentiation; although failure to respond to tuberculin or specific therapy would aid in solving the diagnostic riddle later. Certainly, the course of the disease is typical neither of a tubercular nor of a specific lesion.

Dr. Martin's suggestion that a hidden focal infection may be responsible is worthy of serious consideration. The acute onset with rapidly developing, fluffy choroidal infiltration and vitreous opacities, bespeaks an inflammatory process of toxic origin. The disease shows a predilection for young adults. The most frequent foci of infection in young people are the tonsils, the nasal accessory sinuses and, in the male, the genito-urinary tract, especially the prostate gland. In view of the probability suggested by Dr. Martin, future cases should have the benefit of a systematic search for infections of this character.

Repair of the Tarsus.

Dr. E. H. Cary, Dallas, Texas. In the few cases in which the repair operation has been done, there has been a distinct lesion, traceable to a definite cause, which has been removed. If you can understand the pathologic changes that have taken place, your operation will be directed to affect these. The only difference between my operation and any of the methods previously employed for entropion is that I have corrected the pathology of the lid. When the cases present pannus, you have already pathologic changes in the tarsus, fascia or orbicularis muscle, as well as in the conjunctiva. I take out the diseased portion of the orbicularis muscle, and squeeze and roll out the indurated masses under the lid, just as is done in an expression operation for trachoma. When the tarsal fascia has become thick and has formed a band, I introduce a spatula under this band and take away the excessive amount of fibrous tissue. I never buttonhole the conjunctiva, unless by accident. In early cases it is not necessary to cut the tarsus.

Discussion.—Dr. J. A. Stucky, Lexington, Ky.: I believe that we have been entirely too radical in our treatment, and I have almost discarded the use of the extraction forceps in cases of this kind. We should examine the nose, and if there is any need of drainage there, attend to it. I believe, with Ziegler of Philadelphia, that the retained matter in the lacrimal sac has often a great deal to do with trachoma. I employ frequent forcible dilatation to

correct this. All cases of trachoma require refraction, and the condition returns if the refractive error is not corrected. I have never tried Dr. Cary's method of removing the orbicularis muscle, but I believe in a thorough canthoplastic operation. I have found better and more lasting results from the use of grattage and trichloracetic acid, than from any other mechanical or remedial agent. I have obtained better results by removing the cartilage than by letting it alone. I think that if we secure a smooth cicatricial surface, that is as much as we can expect in these far advanced cases of trachoma.

Dr. William T. McCurry, Little Rock, Ark.: I have had charge of the blind children of the State of Arkansas for the last three years. At least forty-five of the three hundred children are blind from trachoma, or have that disease in some stage. We dismiss from five to eight per cent cured every year. They are well enough to go home and take up the work in the schools. The unfortunate thing is that the children are sent to me only after they are almost blind. It is a horrible thing for a doctor to allow this kind of thing to go on in a civilized country, and not try to arrest it. There are certain badly infected spots, but it is all over the United States.

Dr. Frank D. Boyd, Fort Worth, Tex.: Dr. Cary lives just across the river from me, and I have many patients on whom he has operated. I know that he has been doing this work successfully for years. It behooves us to take what he says home with us and study it thoroughly. We know that in old trachoma, the tarsal cartilage is bound to be in a diseased condition; and when we have removed the granules and relieved the horrible disease, we have not finished our job. We must remove every condition that is pathologic.

Dr. John Franklin Rowland, Hot Springs, Ark.: I have been talking with some of my colleagues since Dr. Green read his paper, and find that they do the operation that he does for cases of long standing with the cartilage involved. I do the operation as Dr. Beard does it; but I saw Dr. L. Webster Fox, of Philadelphia, do his different operation, removing the cartilage without the conjunctiva. He thinks that when you leave a smooth margin of cartilage just under the cul-de-sac, you get a better result.

Dr. John Green, Jr.: I have invariably done this work in a very sharp light, and have tried to isolate each individual granulation and express it. The work can be done too gingerly, but one should not be too vigorous in one's expression. I have found excision of the tarsus of the greatest service in cases in which no other measure has served the purpose. I believe in the Kuhnt operation with retention of the fibers, but I have sacrificed the fibers that overlay the tarsus. There has been some shrinkage, but the operation has been satisfactory in cases in which other measures have fallen short of effect. If trachoma were a reportable disease, we could know of its prevalence and introduce measures to control it.

Dr. H. H. Martin: Dr. Cary contends that, in addition to pathologic cartilage you have pathologic tissue over and under the cartilage, including the orbicularis itself. He not only removes the cartilage, partly or wholly, but also all the pathologic tissue. To my mind, he is on the right track. If any operation previously done had given satisfactory results, there would not be so many different operations performed. When I saw Dr. Cary's patients, heard them tell the condition that they had been in before the operation, and saw that they were cured as far as the dreadful results of trachoma were concerned, I became convinced of the value of his procedure. His cases get well. With our old operation of simply removing the cartilage, some patients get well and some do not.

Dr. Cary (closing): Very frequently there is terrific pannus; but the cartilage is not much involved. In that case, I do not sacrifice the tarsus. I take out a little wedge, and try to be sure that I have broken up everything that is contracting. No more than forty or fifty percent of cures have been

claimed for the best operation for this condition so far devised; but I know that I can cure all the cases with this operation. If you do not cure them with this operation, there is some place left that you must fix. Perhaps it is a refractive error. If you do not correct it, they will redevelop the symptoms of a trachomatous condition. On practically all of my cases no one could tell from their appearance seven or eight years after the operation that any operation had been done, provided that there had not been a loss of structure previous to the procedure.

Trachoma Commission.

A motion was passed that the Chair appoint a commission of five to investigate trachoma and report at the next annual meeting the work done by the various workers in this field, and the following were appointed: Drs. R. H. T. Mann, J. A. Stucky, J. W. Jervey, John Green, Jr., and Marcus Feingold.

Treatment of Pneumococcus Ulcer of Cornea with the Thermophore.

DR. JOHN GREEN, JR., St. Louis, Mo. No one enters on the care of a pneumoccal ulcer of the cornea without misgivings. I have used various agents in these cases. If, in the course of the treatment, the ulcer extended and hypopyon formed, I did not hesitate to perform corneal section and evacuate the hypopyon. This was a last resort method, however, and last resort measures are not usually productive of very brilliant results. I now wish to report five cases in which I used Dr. Shahan's method of treatment with good results. It is unwise to speak too dogmatically of the value of any new therapeutic method, but I cannot escape the conviction that Dr. Shahan has presented us with a method of great value in the treatment of these cases. It has an exactitude far exceeding that of other therapeutic measures. The only immediately destructive effect is on the epithelium, which is soon replaced. That the infection is checked, is proved by the disappearance of the hypopyon, the stopping of the spread of the ulcer, and the cessation of pain. Anterior synechias do not have time to form, on account of the quickness of the effect.

DISCUSSION.—Dr. W. E. Shahan, St. Louis, Mo.: These cases reported by Dr. Green constitute the first individual observation on this particular mode of applying corneal thermotherapy. The method was not the result of a happy thought or accident, but was elaborated by a series of animal and laboratory experiments extending over several years. Methods of radiation have been largely failures, because the quantity of heat entering the cornea cannot be controlled or measured. This method differs from others in its exactness. The exact doses of heat are let directly into the cornea through masses, for certain lengths of time; and all the factors are under control.

In applying the instrument, the cornea is first anesthetized. The instrument is heated until the temperature reaches 158° F. Then the instrument is placed in direct contact with the ulcer for one minute. If the anesthesia has been well done, the application is free from pain. The process must be repeated until the whole ulcer has been covered with the heat for one minute.

The mode of action is threefold: First, the destruction of the organisms in the substantia propria of the cornea; second, the direct flow from the surface of the ulcer, pushing out dead leukocytes and bacteria; and third, the formation of a dense leukocytosis, which is what has caused such remarkable freedom from infection in these open surfaces. The results from the use of this instrument have been so constant and unvarying that I begin to feel almost justified in saying that this is the specific treatment for corneal ulcer.

Dr. R. H. T. Mann, Texarkana, Tex.: Many eyes were lost from cataract as the result of the old method of treatment with the electric cautery, due to the overheating of the aqueous humor. I am glad to hear that with a temperature of 158° there is no permanent damage done to the eye.

Dr. Green (closing): It is possible that other types of corneal ulcer than that due to pneumococci may be benefited by this treatment. Dr. Shahan's investigations, however, have been limited to ulcers of that type. Possibly a corneal ulcer from gonococci might be helped by this treatment. There has been nothing tending to confirm the suspicion that cataract might result from overheating of the aqueous with this method.

Removal of Tonsils for Recurrent Iritis.

Dr. M. M. Cullom, Nashville, Tenn.; We now look on iritis as the result of infection with some form of bacterium. This change in our opinion causes a change in the form of our therapeutic attack. A negative Wassermann having disposed of a specific origin, we make a careful examination for the focus of infection. This having been found and eradicated, there ensues a clearing up of the iritis and a shortening of the course of the disease. I had a patient with recurrent iritis, the attacks usually lasting about six weeks. I had assumed that the iritis was the result of syphilis. He asked me to examine his tonsils and remove them, which I did; and from that day on he has had no attack of iritis. Since then, I have removed the tonsils in two other cases of recurrent iritis, with the result of a cure. I have now had twelve similar cases. Every case of iritis should be rigidly investigated for the source of infection. If one determines that the tonsils are at fault, one should remove them. If the teeth are responsible, remove them and drain the alveolar abscess. The source of infection should be eradicated without waiting for the iritis to clear up.

Discussion.—Dr. John Green, Jr.: We are getting away from the idea that syphilis is responsible for all cases of iritis. We used to be surprised, if we found a case in which syphilis was not the true etiology. Every source of focal infection should be investigated. Dr. Cullom did not mention the genitourinary tract. I am convinced that the posterior urethra and prostate contain infection that is responsible for iritis attacks. Unless you determine the etiologic factor, empiric therapy will not carry you very far. It is only when you have eradicated the focal infection that you get permanent cure.

Dr. Robert W. Bledsoe, Covington, Ky.: It is my belief that an iritis that is purely local does not exist, except when it is of specific origin. I have many times removed badly diseased tonsils with the result of curing iritis. I experimented, to see whether the tonsils were responsible for the iritis in such cases, in the following way: I squeezed the juice out of the tonsil as well as I could, and sprayed the throat well with an alkaline solution. Then, with a probe dipped in tincture of iodine, I went into each crypt that I could find. In several cases in which I carried out that experiment, I found the iritis to disappear under a placebo in place of the usual medication. I then removed the tonsils.

Dr. Eulany, Madison: Syphilis is rarely the direct cause of iritis. It is more of a predisposing cause, a condition that lowers the vitality and makes the individual more susceptible to infection. I had one case of iritis that was positively due to a chronic gonorrheal infection, urethral in origin. The only way in which we could clear up this iritis was by use of autogenous vaccines. I had one case due to an infected maxillary antrum, the infection being streptococcal in origin. We have not been able to find the cocci that produce the majority of the conditions. The tonsil is productive of most of the cases, but you often find skin conditions responsible. I wish to report having a case of gall bladder infection associated with iritis.

We may find the main focus of infection in any part of the body. The thing to do is to study the patient from head to foot. The ophthalmologist should associate himself with an internist who will take the time and trouble to make careful examinations of all patients. Infection often travels up stream in the lymphatic circulation; and in the phlyctenular infection associated with these cases, the infection is carried

through the lymph to the tissue itself. The appendix is, next to the gall bladder, more frequently infected than any other part of the body.

Dr. H. H. Martin: When I was a student, we were taught that there were only two kinds of iritis, syphilitic and rheumatic. Now we know that while there are a few cases of syphilitic iritis, they are so different in character from other cases of iritis that they may almost be diagnosed without a Wassermann.

Dr. Cullom, closing: It is remarked that a man of such wide observation as Dr. de Schweinitz should have made the statement that seventy-five per cent of all cases of iritis are due to syphilis. I think Dr. Bledsoe's plan is very clever. While I approve of autogenous vaccines, I cannot but think that when you have eradicated the foci of infection, the circulation will take care of any infection remaining; so that the autogenous vaccines are not so important as some of us have been taught.

Officers for 1918.

The following officers were elected by the Section: Chairman, Dr. E. J. Cary, Dallas, Tex.; Vice-Chairman, Dr. J. A. Stucky, Lexington, Ky.; Secretary, Dr. W. T. Patton, New Orleans, La.

LULU GAY, Reporter.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

November 19, 1917.

DR. PAUL GUILFORD, President, in the Chair.

Ocular Manifestations of Reflex Origin.

DR. B. F. ANDREWS said that ophthalmologists are familiar with the many intra- and extraocular phenomena arising from purulent processes in the nose and its accessory sinuses. The literature bearing upon this phase of ocular disturbances is quite profuse. He called attention to another group of ocular disturbances due to extraorbital conditions nonpurulent in character, regarding which the literature is more scant.

He referred to that rather numerous class of cases which well nigh exhausts the patience, and baffles the skill of the ophthalmologist, to properly correct with glasses that can be worn with satisfaction for any considerable length of time. These patients came to the ophthalmologist after having passed through the hands of refractionists of repute; had been examined under mydriasis and without; had been refracted with cycloplegics and without. They also bring as proof an assortment of glasses that had been prescribed, each worn with comfort for a time, only in turn to be rejected.

Another group of cases, coming under the same general class is composed of those who, for some defect or other, wear glasses which are comfortable until some operation, or other disturbance involving the distribution of some branch of the trigeminus nerve has supervened. After such an operation, some of these cases discard their glasses altogether, while others are compelled to seek relief in new lenses for the correction of error, differing in kind or degree, from that which existed before.

The cases cited above are of such numerical importance that a satisfactory explanation for their occurrence should be sought, and, if found, doubtless would be welcomed by all. A study of the limited number of cases coming under the author's observation has indicated that the majority are accommodative disturbances, while some appear to be truly refractive. But whether accommodative or refractive, the ciliary muscle acts and reacts as the result of some stimulus applied outside the eye itself. In the normal individual this stimulus originates in the brain, and manifests itself in perfect vision through a crystallin lens of proper curvature, made so by the action of the ciliary muscle. In the nonaccommodative eye, on the other hand, this stimulus must arise outside the domain of the will, resulting in imperfect vision through a lens of improper curvature, made so by the action of the ciliary muscle.

Muscular movements may be classified as follows: Voluntary, involuntary and reflex. Voluntary muscular action is under the control of the will. Involuntary muscular action is under control of the sympathetic nervous system. Reflex muscular action is brought about by the impulse produced by a stimulus applied to a sensory periphery, traveling through a ganglion, where it is switched onto the motor nerve supplying the muscle. The course over which this reflex impulse travels is called the reflex arc.

Without going into a minute review of the trigeminus nerve, its roots, its three main branches and its numerous endings, the author pointed out the components of the reflex nerve tract reaching the ciliary muscle. Following back the numerous motor nerve filaments that supply the muscle, the ciliary ganglion is reached, situated behind the eye and within the orbit. This is made up of three roots, each carrying its own kind of nerve impulse; a motor from the motor oculi, a sympathetic from the cavernous plexus and a sensory from the ophthalmic division of the trigeminus, together with a root communication with the spheno-palatine ganglion, capable of carrying reflex impulses.

The oculomotor supplies all the extrinsic muscles of the eye except the superior oblique and the external rectus, while the ciliary ganglion supplies the intrinsic, namely, the ciliary and the sphincter of the iris. The spheno-palatine ganglion is made up of three roots; a motor from the facial, which unites with a sympathetic root from the carotid plexus to form the vidian, and a sensory from the maxillary division of the trigeminus. This ganglion is also connected directly with the otic ganglion by a root communication, besides the communication with ciliary ganglion, referred to.

The spheno-palatine ganglion receives sensation from all parts of the interior of the nose except a small area on the lateral and septal walls anteriorly. A line of nerve communication, then, is established between the nasal cavities and the ciliary muscle, forming a reflex arc, having as its components the sensory filaments in the nose, the spheno-palatine ganglion, the interganglionic line from the spheno-palatine to the ciliary, the ciliary ganglion, and lastly the motor nerve filaments to the muscle.

Having this reflex arc, is it not fair to assume that reflex impulses may reach the intraocular muscles and influence them in the disturbance of vision? May it not be possible, or even probable that irregular contraction of the ciliary muscle may result in distortion of the lens, and in the production of lenticular astigmatism? In fact, may not any erratic action on the part of the ciliary muscle be attributed to some irritating cause outside the eye? If such be the case, it behooves us as ophthalmologists to institute a thorough search for the source of irritation wherever it may be.

The question of peripheral localization has not as yet received the attention that it deserves. But if the reflex hypothesis is correct, the source of irritation ought to be found in some area whose sensory filaments center in some ganglion, where some of these filaments arborize around motor cells whose axis cylinders reach the disturbed muscle. As no sensory nerve filaments from the eye pass into the ciliary ganglion to make up a reflex arc, the irritating cause would hardly be looked for in the eye.

The ganglion next in course is the spheno-palatine, whose sensory distribution is the mucosa of the turbinates and meatuses on the lateral walls of the nasal cavities, and that of a corresponding area on the septum. It goes without saying that these regions should be examined with minute care for any irregularity that may be the cause of the disturbance.

In those cases coming under the author's observation, these intranasal areas have been the seat of by far the greater number of irritative conditions producing these varying ocular symptoms, and when found and properly removed, glasses then adjusted to the eye conditions present remain indefinitely satisfactory. The author is convinced,

therefore, that these eye manifestations should be regarded as symptoms pointing toward the underlying cause.

Discussion. — Dr. Frank Brawley cited a case in connection with Dr. Andrews' paper, although it did not follow the reflex arc through the spheno-palatine ganglion. Many examinations of the eye had been made and many different pairs of glasses had been ordered, and when he saw the case he was not able to find the refraction essentially different from the number of pairs of glasses which the patient had formerly tried. In making the nasal examination X-ray pictures were made of the sinuses which were found negative, but accidentally an impacted wisdom tooth was found and when all teeth were filmed there was an impacted wisdom tooth in each lower jaw. When these were removed there was no further need for glasses or any eye treatment.

Dr. E. V. L. Brown asked Dr. Andrews if he had seen any cases of genuine spasm of accommodation that could be attributed to such irritation through the nose; vision had been previously established to be normal, and then suddenly the patient developed apparently a myopia of from one-half to two or three D., which could be promptly corrected with a minus one or minus two glass, as the case may be; then under atropin the spasm could be relieved, but after the atropin had been stopped the spasm would return. Is there any definite relation between these cases and accessory sinus disease? Dr. Brown had seen five such cases in the past year, but had not been able to find any cause for them.

Dr. Oliver Tydings cited a case that came under his observation years ago. A piano manufacturer came to him with an ulcer of the cornea. Examination showed that a canaliculus on the same side as the ulcer of the cornea had been split up, while in a hospital in Copenhagen where he spent three months fifteen years before; and there was the scar of an old ulcer of the cornea of that attack. The patient had been under the care of another oculist for some weeks, without any improvement. In making an examination for other possible sources of trouble the middle turbinal on that side was found very much hypertrophied. He advised the patient, if the eye did not improve, to have the middle turbinal removed as that was undoubtedly the source of the trouble. After a few days, no improvement taking place, the eye becoming progressively worse, the middle turbinal was removed. In twenty-four hours there was a marked improvement and the ulcer healed in a week.

Dr. Andrews, in replying to Dr. Brown, said that he had not had a case of spasm of accommodation that could be overcome under the influence of cycloplegics.

Narrowing of Pupil Does Not Lower Normal Intraocular Tension.

Dr. Andy M. Carr read a paper on this subject in which he reported 100 cases from the Research Laboratory of Cook County Hospital. These observations were made to determine whether or not there is a lowering of normal intraocular tension when the pupils are made smaller. The necessity for determining this matter arose from routine clinical work on three different types of cases. First, borderline glaucoma cases. In these cases the author dealt with slightly enlarged pupils, suspicious cups, inconclusive narrowing of the fields, and a tension above say, 25 mm. Hg. It was often noted that there was definite lowering of tension after a miotic, while at other times there was no change.

2. Definite high tension, simple glaucoma in one eye, with tension well within socalled normal limits in the other eye. The tension frequently fell in this second eye, although in some cases it remained unchanged after miosis. (Story.)

3. Acute inflammatory glaucoma in one eye with normal tension in the other eye unaffected by narrowing of the pupil. (Field.)

It is evident that in these types of cases it is of prime importance to know whether or not normal tension is reducible by miotics.

The material consists of 100 cases studied at the Cook County Hospital.

They were patients that gave no history of eye trouble and were not seriously sick. Their ages ranged from 12 to 67 years. Only cases in which satisfactory tonometer readings could be made were used.

As in a previous series of cases, all tension readings were taken with the Schiotz tonometer, and holocain in 2 per cent solution was used as an anesthetic. The size of the pupil was first noted, then the tension taken. One-half hour later the tension was again taken. The pupils were then rather quickly contracted with eserin salicylat in one or two per cent solution. The average size of the pupils after the miosis was one and a quarter mm. All pupils were contracted to at least 2 mm. Holocain was again instilled and the final tonometric readings taken.

In no case was there a lowering of tension following the contraction of the pupil greater than 3 mm. Hg. This amount is well within the recognized limits of error of observation in the use of the tonometer. There was in no case any difference between the first and second readings before the miosis.

Following the use of the eserin many patients complained of diminution of vision and headache; a few of them complained of pain within the eyes; a few became nauseated, while four or five vomited. The pupils remained contracted a variable length of time—in a few eyes as long as 72 hours.

From this series of 100 cases the author concludes that intraocular tension in normal eyes is not to be lowered by the narrowing of the pupil. The corollary of this statement, namely, that a decrease of intraocular pressure following the use of a miotic necessarily means that an eye is glaucomatous, is not even herewith postulated and does not properly come within the scope of the paper. The author verified the statement frequently made, namely, narrowing the pupil does not lower normal intraocular tension.

Unilateral Exophthalmos.

Dr. Oscar Dodd reported a case of proptosis which was first noticed on the 4th of July by the patient. The eye was proptosed fully 5 millimeters, with no other symptoms whatever. At first, he thought it might be a case of exophthalmic goiter showing in one eye, but all symptoms of Graves' disease were absent except the proptosis. After going into the history of the case he found that about a month before this was noticed the boy was hit on the side of the head quite a severe blow with the flat of the hand, causing considerable trouble with the ear on that side for two or three weeks. There are cases of proptosis due to an interference with the sympathetic, but it has never been the author's privilege to see unilateral proptosis after such an injury. He has not had time to look up the literature and has not fully concluded as to the cause of the condition. If any of the members had had experience with such cases and could throw any light on the subject, he would be very much obliged to them. There is no muscle disturbance. Vision and motion are normal, and there is nothing except the proptosis, which is less after having the eye closed at night.

Major H. Worthington,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

December 15th, 1917.

Dr. Geo. F. Libby, Presiding.

Sclero-corneal Tuberculosis.

Dr. J. A. McCaw presented Mrs. D. S., age 35. O. D. lost with some inflammatory disease, and was finally enucleated by Dr. Coover. July 26, 1917, she came to the university clinic with a badly inflamed eye, lacrimation, and photophobia. Examination showed a zone of redness around the sclero-corneal margin. At the temporal border of O. S. was a nodule about the size of a bean, elevated above the sclera, and extending into the cornea about 1 mm. The sclera had a decided bluish cast. The Wassermann was negative. The patient was put on 10 gr. K. I. t. i. d.; then in two weeks a second Wassermann was made which was + 2.

Specific treatment was pushed, by mouth and by inunction, but the eye grew steadily worse. Then a von Pirquet test was made and was strongly positive. She was given bacillen emulsion, with steady improvement until the present, when the nodule has disappeared. Dose: B. E. 2/200 cc. to 8/10 cc. Atropin was used locally.

Discussion.—Dr. M. Black asked if she had any general reaction following the administration of tuberculin, to which Dr. McCaw answered in the negative, but he said she had a slight focal reaction at times. Dr. Black suggested a larger dose for the general reaction in order that the therapeutic treatment may be governed by the general reaction and the doses kept just below the point which will produce a general reaction. After several months she should again be given enough tuberculin for the general reaction, in order to determine the necessary doses from time to time.

Dr. E. R. Neeper asked why the Wassermann hasn't been followed up to see if she reacts to the Wassermann test now. He believed that she should be treated for both lues and tuberculosis in order that she may be able to give a negative Wassermann.

Dr. McCaw, replying to questions, said the patient did not give any history of miscarriages, nor did her children show any evidences of congenital lues. She had not been examined for evidence of pulmonary tuberculosis.

Dr. H. R. Stilwill said she had involvement of O. D. in the university clinic several years ago. At that time the sclera was very thin, and looked as if it would rupture at any time. Dr. D. H. Coover suggested enucleation of O. D., which was duly performed.

Primary Optic Atrophy.

Dr. H. R. Stilwill presented Master K. G., age 8. First seen Dec. 8, 1917. He is a bright and rugged boy; in the third grade of school; youngest of five children; all healthy. Mother thinks he has always been "near sighted." Recently received notice from school authorities on account of poor vision.

V. O. D. $=4/20+1$. V. O. S. $=4/15$. ℞ Atropin for refraction.

Ophthalmoscope: Both nerve heads white, more marked in O. D. Choroidal ring distinct and broadened; nutrient vessels on disc faint; not much change in veins and arteries, but they are diminished in number. Degenerative changes in retina; more marked in macular region. Fields contracted for form and color. Wassermann blood test positive.

Discussion.—Dr. E. Jackson believed syphilis probable in this case. The changes in the nerve head, retina, etc., as well as the positive Wassermann, all indicate lues. He believes congenital syphilis often runs its course in very early childhood, before the children are seen by an ophthalmologist. It seems apparent from this child's fundi that the disease had probably run its course, and that the fundi will show very little, if any, change later on.

Dr. M. Black said he feared a keratitis later on. He would seriously consider this, and administer prophylactic treatment. He believes there is some organized exudate on the nerve head and that this is not typical primary atrophy of the disc.

Dr. W. H. Crisp said aside from the atrophy of the disc this case is not very typical.

Dr. E. R. Neeper stated that Dr. Friedman had presented a woman before this society several years ago whose fundi were much like the child's. She had vision of 20/20 at that time. The members were doubtful about the diagnosis with such excellent vision. However, the fields were slightly contracted.

Dr. G. F. Libby asked how much dependence we can put in the Wassermann test. If we can depend upon it, we should treat and prevent lues in the future.

Traumatic Dislocation of Lens.

Dr. M. Black presented a man, age 30, who gives a history of having been struck in O. S. with a board, on Jan. 26, '16. He was taken care of at the time by Dr. C. E. Walker. The inter-

esting feature of the case is that the lens has been dislocated and the closest examination on Dr. Black's part revealed no evidence of its location. The media are clear. There is considerable atrophic looking matter, pigmentation, immediately below the disc. The probabilities are that this was occasioned by a rupture of the choroid in this situation at the time of the injury; and that hemorrhage followed, which subsequently organized, leaving the present appearance.

Discussion.—Dr. Matson said this injury occurred early in the morning. The patient was cut on the lower lid, and probably there was a scleral rupture, but none was found. There was a decided hemorrhage into the anterior chamber and vitreous. A piece of iris was floating in the anterior chamber. Atropin was used, but there was no pain.

Dr. Walker confirmed these observations by Dr. Matson, regarding Dr. Black's patient. Dr. Walker said there was such an extensive hemorrhage of the whole eyeball that it was impossible to see any of the details of the fundus. This was eventually absorbed. The lens was not found.

Dr. W. H. Crisp inquired if the atropin had been used for any length of time and was answered in the affirmative. He said he asked this because recently he saw an elderly Jewish patient who had been struck in the eye with a piece of wood. Atropin was used, but a few days later the tension was elevated; there was pain, redness, etc. The atropin was immediately stopped and eserin used. Ten days after the injury he found the lens in the vitreous chamber.

Result After Cataract Operation.

Dr. M. Black presented a woman upon whom he had operated September 27th, 1892, for a cataract in O. S. She was then 40 years of age. O. D. was normal in every particular. The left pupil was very conspicuous for the lens was very white. He performed a simple extraction. The cosmetic result is perfect. She came to the clinic a few days ago complaining of visual failure of the other eye and upon examination he found advanced lenticular changes. He found the refraction of the aphakic eye to be $+13.00 \bigcirc + .50$ Ax. 120° with resulting vision of 20/30. The fact that this eye could go 25 years, and suddenly resume almost its normal visual power when corrected by a lens, was very interesting to him. He was inclined to think that had he not operated upon the eye it would today be a useless organ and probably diseased.

Discussion.—Dr. W. H. Crisp spoke of a case of congenital amblyopia of one eye and high myopia of the other eye. This patient obtained good vision in the myopic eye with the correcting lenses. He stated that sometimes one obtains better vision for a patient than he expects in one case, and not as good as one should expect in another. He further stated that in Dr. Black's patient the eye has been straight all these years and there has been a retinal image on the macula, even though it is blurred in the aphakic eye. This tended to keep up the function of the retina, so there would be normal vision with correcting lenses.

Steel in Orbit.

Dr. F. R. Spencer presented Master R. P., age 5. Struck in O. D. with a small piece of steel Dec. 7th, 1917, while his father was striking the blade of an axe with a hammer.

The piece of steel entered the limbus at the inferior nasal quadrant, and passing through the iris, vitreous and sclera, lodged in the cellular tissue of the orbit, 2 or 3 mm. internal to and about 3 mm. above the optic nerve. The foreign body measures 1 by 3½ mm. in size, and is undoubtedly magnetic.

When examined 36 hours later, the anterior chamber had reformed, but the wound of entrance was very much in evidence as it is now. The examination of the fundus was very unsatisfactory, as the vitreous was full of blood. It was impossible to see any details in the fundus. Dionin and atropin have been used.

December 15th, 1917, V. O. D. can recognize hand, but can't count fingers. V. O. S. 6/7.5.

DISCUSSION.—Dr. M. Black said the foreign body in this patient is probably lodged in the retina near the posterior pole or possibly in the choroid or sclera. He has never seen a foreign body penetrate all the tunics of the eye when a piece of steel or iron had struck the eye, despite the X-ray findings to the contrary. He said that a bullet might easily penetrate all the coats of the eyeball, but splinters of steel and iron in his experience had not.

Dr. E. R. Neeper replied that he had one case in which a foreign body passed entirely through the eye and lodged in the orbit.

Dr. E. Jackson said one X-ray test is almost positive. This can be made by having the patient look as far down as possible while one exposure is made on the X-ray plate, then have the patient look as far up as possible while the second exposure is made on the same plate. In all probability if the foreign body is lodged in the orbit it will not move during this procedure, but if it is lodged at any point in the posterior pole of the eyeball, the X-ray plate will show two positions of the foreign body. He further stated that we should make some allowance for the divergence of the X-rays and the size of the eye in mapping out the foreign body.

Dr. W. C. Bane spoke of the X-ray locating the foreign body in the vitreous in one of his cases. He removed the particle of steel and the patient now has normal vision.

Traumatic Choroiditis and Probably Hemorrhage Into Vitreous.

DR. G. F. LIBBY presented a man, first seen today, age 45. This patient showed a large circular area of choroidal atrophy with pigmentation on the nasal side of the left disc, with a similar triangular patch adjoining the lower temporal quadrant of this nerve head. The latter seemed like a coloboma produced by choroidal rupture. The patient had received a blow over O. S. at 10 years of age; and, at 15, noticed floating bodies before this eye, with gradual loss of vision. At 17 he contracted syphilis, for which he took protoiodid of mercury faithfully for 3 years. Syphilitic manifestations in 1903 led to 2½ years' treatment with mercury and potassium iodid No further signs of activity of the disease occurred until June, 1917, when the vision of O. D. dropped in one week, from normal to bare ability to go about unaided. This condition persisted for 5 months, after which the sight gradually returned to normal in 3 weeks' time. From the failure of vision until its return, ¼ grain of mercury protoiodid was taken t. i. d. Its continued use for 1 or 2 years was advised; with Wassermann reactions and the use of salvarsan on the first appearance of active manifestations of syphilis. Because the fundus of this eye was entirely normal, and from the character of the loss and restoration of vision, a diagnosis of probable hemorrhage into the vitreous seemed warrantable.

DISCUSSION.—Dr. M. Black said this patient is far from being over his syphilis. He should have very active treatment.

Dr. E. R. Neeper said he depends upon the Wassermann test a great deal. He would have this man treated for a time; have a second test made and be governed by it. He would treat him vigorously until the Wassermann is made, and then attempt to keep this test negative by occasional treatment from time to time as the Wassermann shows that it is or is not needed. He allows his patients to marry after prolonged treatment and several negative tests.

Dr. F. E. Wallace suggested the advisability of a spinal fluid Wassermann in many cases.

Dr. E. Jackson spoke of the lesion with recovery in six months. He thought this was rather a short period of time for recovery. He said optic neuritis may run 6 months to 1 year with good vision; however, the vision fluctuates a great deal. He stated this patient's poor vision may have been due to slight vitreous hemorrhages as a result of lues.

Traumatic or Infectious Conjunctivitis.

DR. D. A. STRICKLER reported a case of conjunctivitis in an imbecile child,

aged 10, in an institution of Denver. When first examined there was slight redness of the eyeball; the next day there was a great deal of swelling; and, in 3 hours, profuse discharge. In the lower cul-de-sac he found exudate, which was adherent to the ocular conjunctiva, with bleeding after its removal, and pus in the lower cul-de-sac. Microscopic examination of this failed to reveal diphtheria bacilli, but it did show streptococci and diplococci. There was decided chemosis of the ocular conjunctiva with pronounced edema of the lids. There was a pin head corneal lesion near the lower limbus. Atropin was used and the swelling subsided, but the cornea became rather hazy over the lower half. Dr. Strickler suspected that some escharotic might have been put in the eye by the child or by some other inmate of the institution. But it was impossible to find any evidence of this, and the superintendent insisted that all such things were kept where the mentally defective children could not, by any possibility, get hold of them. The possibility of trauma was also considered. There was no evidence of exudate on the upper or lower lid, as the lower part of the ocular conjunctiva was the only part involved.

Discussion.—Dr. M. Black said the diplococcus of pneumonia may produce this clinical picture.

Dr. W. C. Bane said it was very suggestive to him of trauma.

Probable Retinal Tuberculosis.

Dr. F. E. Wallace reported of a man of 33, railroad employe, seen 2 weeks ago, with a history that he lost his vision rather suddenly in O. S. V. O. D. 20/20 and V. O. S. 20/200. Examination of the disc showed this to be very hazy, and elevated 2 to 3 mm., so that the outlines were almost entirely lost upon one side. The veins on this side were unusually large, although the arteries were negative. Edema was so marked that it obscured some of the vessels and there were small hemorrhages about the disc. Internal to the macula there were white spots which were round, and there were 20 to 40 of these. Vision was reduced to hand movement. The urine was negative and the history of lues was negative, but he admits exposure often. Blood pressure 130. He had a negative Wassermann 2 years ago. He states that he has had no headache and that his eye is free from pain. The temporal half of the eye is worse and the nasal half is nearly normal.

Discussion.—Dr. E. Jackson said swelling of the veins, exudate, and white patches are all suggestive of tuberculosis of the retina. He has a case very much like the one Dr. Wallace has just reported. The patient has been examined very carefully by Dr. C. N. Meader, and has unquestionably been tuberculous in the past.

Dr. W. H. Crisp said the blood pressure might be normal, yet the patient may have advanced arteriosclerosis.

Dr. G. F. Libby spoke of a man, age 73, whose retinal vessels were negative 3 months ago when Dr. Crisp examined his eyes. They were also negative 2 years ago, when Dr. Libby examined them. Recently, one retinal vessel showed very marked beading in the upper temporal quadrant and another had a hemorrhage. The urine was negative one month ago.

Dr. M. Black confirmed Dr. E. Jackson's remarks. Dr. Black said Dr. Wallace's patient may not show other evidences of tuberculosis, yet he may have retinal tuberculosis.

Frank R. Spencer,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting November 5, 1917.

Dr. McCluney Radcliffe, Chairman.

Congenital Cataract.

Dr. P. N. K. Schwenk exhibited a case of congenital cataracts, in a baby boy, in which he removed the lens from each eye. One eye was operated upon at the age of 11 months and the other at the age of 14 months. Attempts at discission failed owing to extreme toughness of lens capsule. He, therefore, opened the anterior chamber by means of a keratome, grasped the an-

terior capsule with iris forceps, and delivered the lens in its capsule. Recovery was prompt. Two months later the left eye was treated in a similar manner, but the capsule tore and some cortex remained in the anterior chamber. The recovery was uneventful. Before the operation there was a divergent squint O. S., but at the age of 16 months he ordered a + 8.00 D. lens for each eye and, when worn, the visual axes were parallel. This is the youngest child he has ever glassed.

At the present time the left eye shows an occluded pupil and a bowed iris due to an accident after leaving the hospital.

Discussion.—Dr. Wm. Zentmayer said: "While this particular case, exhibited by Dr. Schwenk, admits of no other operative procedure than that employed, the left eye illustrates what may, and often does, occur following the operation of linear extraction of juvenile cataract. Here the result was good in one eye, but in the other eye the adhesion of the iris to the wound was extensive and has produced an inflammation which has rendered the eye visually useless. There is no question of the far greater safety of repeated discissions."

In reply to a question of Dr. Kleinhans, Dr. Zentmayer said that he thought the operation should be done early, about the second year.

Tumor of Antrum—Cataract.

Dr. Zentmayer exhibited, from the service of Dr. Chance, a woman 60 years old, who had recently noticed a bulging of right eye preceded by nosebleed. There was a firm ridgelike palpable mass just within the inferior orbital margin. There seemed to be slight bulging of internal process of frontal bone on same side. Movements of the globe were somewhat restricted downward and outward. The fundus could not be examined because of immature cataract which also prevented testing the visual acuity. The patient had just been admitted and was shown for diagnosis. Probably a malignant growth in antrum.

Dr. Zentmayer showed, from service of Dr. Chance, a girl with symmetric lenticular opacities in anterior and posterior cortex limited to one-eighth circumference of perinuclear zone. They were probably of the zonular type.

Coloboma of Lids.

Dr. Wm. Campbell Posey presented a case of bilateral coloboma of lower lids. The notch in the right eye occurred at junction of middle and outer third, in the left eyelid at junction of middle and inner third. Both superior maxillary bones showed faulty development, in consequence of which the right side of mouth was drawn markedly upward. The inner halves of both upper lids exhibited colobomatous tendencies, the lid margins in this position being drawn upward in a sweeping curve with its convexity downward. Dr. Posey had corrected the fissure in the right eyelid by a plastic operation. His colleague, Dr. John B. Roberts, of Polyclinic Hospital, had corrected the deformity at angle of mouth. The coloboma in the left eyelid, which was complicated by symblepharon and marked retraction of the tissues in that region, had resisted correction at the first operation. Dr. Posey said he had another in mind which aimed at correction of the deformity by transplantation of a flap of skin from the root of the nose into the colobomatous area.

Shot Injury.

Dr. Paul J. Pontius presented a case of a boy, 15 years old, who was struck with a shot from an air rifle. The shot struck the sclera of right eye about 10 mm. to outer side of cornea. The accident occurred ten days ago. Patient was first seen 22 hours later. At this examination nothing was seen but the external injury to sclera, which showed as a circular area of hemorrhage 2 mm. in diameter. Eight days later, bulging occurred over this area. Today the fundus shows a patch of choroiditis beneath the site of scleral wound. The surrounding choroid shows some deep effusion and is slightly elevated. There is, however, no retinal detachment. The disc shows minor early optic neuritic changes.

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EDITORIALS.

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.

The consideration that so large a country as the United States of America should be represented in the world's ophthalmic literature by more than one quarterly publication (*The Archives of Ophthalmology*); and that almost every weekly or monthly general medical journal published in the United States contained, in most of its issues, one, or sometimes several articles on ophthalmic subjects; and that it probably was the general desire among ophthalmologists to have such papers united in one special monthly publication,—was what urged me to found such a journal.

The head of the publishing house of J. H. Chambers of St. Louis was willing to undertake the publication. He was undoubtedly prompted to this action, as later became more and more apparent, and as was for him but natural, by purely commercial considerations. I in my—may I say—youthful enthusiasm, did not desire any gain whatever, but only hoped to be able to serve ophthalmic science by means of this journal, and to get into and keep in closer contact with the men devoted to scientific work in our specialty.

At that time, a number of journals in other specialties had made their appearance with the name of "The American Journal" of this or that, and I considered it best to name this new journal the *American Journal of Ophthalmology*. I hoped thereby to appeal more strongly to the ophthalmic working and reading public of the United States. That about two decades previously a journal by the same name had been in existence, I was at this time absolutely ignorant of.

The thing to do was, of course, to get a number of representative ophthalmologists to promise their literary support. Right here my ardor received its first rebuff. A few of the gentlemen thus addressed answered cheerfully and promptly in the affirmative. Most of these have been staunch supporters of the journal to their death, or to its recent merger with the younger ophthal-

mic journals. Some, however, thought the idea preposterous for me to try to publish an ophthalmic journal in the western part of the United States and so far from the seats of learning. Some could not understand what good such a journal was to do to ophthalmology. Some were kind enough to remind me that such an undertaking would be very costly, and that I probably would be unable to keep it up. Some actually never answered my letter.

That so much cold water thrown on my proposition somewhat cooled my ardor, was but natural. When, however, I considered the list of the gentlemen who had promised their support, and furthermore, when I received a letter from a well known ophthalmic worker in a western city which started with the words: "Hurrah! for you to have the courage to start an ophthalmic journal west of the Alleghenies," I took fresh courage, and in April, 1884, the first number of the *American Journal of Ophthalmology* made its appearance.

The following explanation of its origin and of the ideals which in my opinion were to guide it, was published with the first number:

"Although a very large number of ophthalmologists are practicing on the American continent, the results of their scientific researches and practical experiences, have thus far, either remained unpublished, or have been more or less lost to their professional brethren by being published in general medical journals.

"The only medium of which for a number of years the American writer on ophthalmic subjects could avail himself, the *Archives of Ophthalmology,* is issued only quarterly, and from their international character, they afford only comparatively limited space for American writers.

"To give the American ophthalmologists such a medium for communicating the results of their scientific researches and their clinical experiences to their professional brethren, the *American Journal of Ophthalmology* is intended.

"Its principal object shall be to give a full representation of the scientific work of American ophthalmologists, and to form a record of each step in the advance of ophthalmic knowledge made by American writers. In order to reach this aim, a number of American ophthalmologists of high standing have been asked for, and have promised their support to this journal."

Considering the conditions then existing, the Journal was well received. Soon, also, numerous papers were contributed from known and unknown sources. But alas, the fate of an editor was soon made clear to me, when I was forced to return quite a number of manuscripts as unfit, and when one author who absolutely desired his name and paper to appear in print, returned it to me with the bribe of a ticket to the County Fair and a number of chances on some farm machinery! Space would lack if I should undertake to relate all my partly distressing, partly comical experiences. Suffice it to say, that I tried to preserve the character of the journal, in spite of all vicissitudes. The latter were in a great measure due to the publisher, whose whole interest seemed to be to make as much money out of the publication as possible. In spite of my ardent protests, the list of advertisements accompanying the journal grew very large, and many were of a character which greatly offended me. But my hands were tied. Made desperate, I finally told the publisher that I refused further to conduct the Journal, but if he would name his figure, I would buy him out. He did so, and with the beginning of 1896, I became the sole possessor of the Journal. Beginning with that year, I changed the size of the page of the Journal, and gradually got rid of the commercial advertisements. What the latter means to a journal of limited circulation, almost every one can figure out. It took some courage, but it was worth while.

In order to improve the scientific value of the Journal, I had to have some help, as my time grew very limited. Dr. J. Ellis Jennings kindly accepted the position of Assistant Editor. He was succeeded in this office by Dr.

W. A. Shoemaker, in 1900; Dr. J. F. Shoemaker, in 1909; and Dr. W. F. Hardy, in 1914. The work of these gentlemen added greatly to the efficiency of the Journal, and made the work easier for myself.

It is a truism, that nothing in this world is perfect, that the ideal is a thing we can never reach, or it would no longer be an ideal. The Editor of a journal is, perhaps, in as good a position to perceive the truth of these sayings as any one else. Certainly, it has been my experience. Yet, in spite of all adversities, the *American Journal of Ophthalmology* has lived, and I believe, fulfilled its mission, thanks to the many loyal supporters, who, now that it is defunct, will, I have no doubt, transfer their goodwill and loyalty to the new AMERICAN JOURNAL OF OPHTHALMOLOGY.

ADOLF ALT.

THE ANNALS OF OPHTHALMOLOGY.

A RETROSPECT.

"The King is dead! Long live the King! After years of faithful attempt to serve the medical profession and to mirror for the benefit of those laboring in the field of Ophthalmology the progress of their specialty, the *Annals of Ophthalmology* has ceased to exist, or rather has combined with other ophthalmic journals to form the new AMERICAN JOURNAL OF OPHTHALMOLOGY, as the river gathers to itself and merges with other rivers to form a mighty stream that sweeps on to the sea, to mingle its waters with that from all other sources. May its valedictory be the salutatory of a new era, where the seeds sown in the past may ripen into a more glorious fruition.

In 1892 Dr. James Pleasant Parker of Kansas City, Mo., feeling the need of a journal which should represent the special branches of ophthalmology and otology, founded the *Annals of Ophthalmology and Otology.* The purposes of the new journal as set forth in its Prospectus were as follows:

PROSPECTUS OF THE ANNALS OF OPHTHALMOLOGY AND OTOLOGY—1892.

It is believed by the Incorporators of the Association under the authority of which the Annals of Ophthalmology and Otology is published, that with the recent great advances made in medical science and art, the time has come when the busy progressive practitioners of medicine in the Western and Southern States will give substantial support to a Periodical devoted to Practical Ophthalmology and Otology, including their allies, Rhinology and Laryngology.

The Annals is published with the following aims:

1. To afford Specialists, with well-earned reputations, a medium for communicating the results of their observation and research, and to disseminate meritorious contributions to the literature of Ophthalmology, Otology, Rhinology, and Laryngology, giving especial attention to Practical Articles devoted to Medical Ophthalmology, Ophthalmoscopy, and the Pathological relations between the Eye, Ear, Nose, or Throat, and the general system. It is hoped that the interests of the General Surgeon and Physician, as well as of the Specialist, will be subserved by such a Journal.

2. To furnish a brief condensed Report of Progress in the four important departments of Medical Science mentioned, in which shall be recorded the most recent advances of real and permanent value and practical interest, from the current medical literature of the World. These reports will be written by specialists well qualified for the work.

Each number of the Annals will contain about eighty pages, and will be issued quarterly. The yearly volume will thus contain about three hundred and twenty pages, fully indexed.

The subscription price will be Two Dollars per annum, in advance.

Address all communications to the editor,

JAMES P. PARKER, M. D.
S. E. Cor. 12th St. & Grand Ave.,
Kansas City, Mo.

The idea of starting a special journal west of the Mississippi was a very ambitious one, although ground had been broken by the American Journal of Ophthalmology. However, the new journal was to be a quarterly, was to contain articles on oto-laryngology as well as ophthalmology, and in addition was to contain a review of the best literature on these subjects, published in other magazines. Dr. Parker, from the very beginning surrounded himself with a strong staff, consisting of Drs. Casey A. Wood, B. E. Freyer, T. Melville Hardie and M. D. Lederman, in which additions and changes were made from time to time as occasions arose. The contributors to the first number were Drs. D. B. St. John Roosa, M. Michel, Edward Jackson, Geo. M. Gould, Peter D. Keyser, Casey A. Wood, Julian J. Chisholm, S. D. Risley, J. Herbert Claiborne, Henry L. Wolfner, George T. Stevens, Charles H. Burnett, Lawrence Turnbull, J. A. Maloney, S. MacCuen Smith and J. W. Gleitsman, all men of high standing in their respective specialties. In 1893 Dr. Parker moved to St. Louis, from which city the *Annals* was published continuously up to and including 1917. The high class of the contributions of the first number has been consistently maintained, and the progress of ophthalmology and oto-laryngology in the United States is in a large measure due to the papers that have appeared in the Annals. Moreover, from its editorial staff have graduated the editors of two other prominent ophthalmic journals.

In 1896, Dr. Parker died, but this sad event was not permitted to cause the death of the journals. Mr. Jones H. Parker continued it is a memorial to his brother, and placed the active conduction in the hands of Dr. Casey A. Wood, of Chicago. Dr. Wood remained editor until 1900, when he left to become the editor of the Ophthalmic Record. He was succeeded by Dr. H. V. Würdeman, of Milwaukee. who remained the editor until 1904. At that time, he in turn left to become editor of Ophthalmology. He was succeeded by Dr. James Moores Ball of St. Louis, who held the position until 1906, when Dr. W. A. Shoemaker of Philadelphia became editor and held the position until 1911, when he was succeeded by the last editors, Drs. Meyer Wiener and Clarence Loeb. In the meantime, the number of papers had become so great, and the divergence between the specialties of Ophthalmology and Oto-laryngology had proceeded so far, that in 1897 the *Annals* was issued in two separate publications, known thenceforth as the *Annals of Ophthalmology* and the *Annals of Otology, Rhinology and Laryngology*, the latter with Dr. H. W. Loeb of St. Louis as editor. In 1917 Mr. Parker, believing it for the best interest of the profession, gave his consent to the merger of the *Annals of Ophthalmology* with the other journals which now constitute the AMERICAN JOURNAL OF OPHTHALMOLOGY, May the hopes which prompted the founder and animated the various editors and staffs of the Annals be brought to an even more fruitful realization.

C. L.

THE OPHTHALMIC RECORD.

In the first issue of the *Ophthalmic Record*, I wrote, as founder and editor: "No chorus of voices, imaginary or real, has called him to the editorial chair"; and in the same editorial I wrote: "The editor and publisher of the *Ophthalmic Record* has contemplated, for a long while, entering the field of journalism." The two statements quoted above expressed the truth, but not the whole truth, concerning the inception of the *Record*. Its publication certainly would not have been started in 1891, and possibly never, if an event had not occurred which, in itself, might have deterred, rather than have encouraged, such a venture. No record of this event has been made up to the hour of writing this "bit" of history; and it is given now only because it cannot harm the one who is living, and cannot reflect on the noble character of the one who is dead—there were only two parties concerned.

I had discovered the secret of oblique astigmatism in the fact that retinal images were distorted and displaced by

it; and that, to harmonize such images—as the two images of a horizontal arrow—the oblique muscles had to perform an abnormal function, that of either converging or diverging the vertical axes of the eyes, their normal function being to keep these axes parallel. In the latter part of 1890, I prepared a paper on the subject, wording the title as follows: "The Harmonious Symmetrical Action of the Oblique Muscles in All Cases of Oblique Astigmastism." I went to some cost, and exercised severely my power of designing, to procure suitable illustrations, and early in 1891 offered it for publication in the leading eye journal of America, if not of the world. I read the paper before the Nashville Academy of Medicine on the 15th day of January, of that year, having forwarded, only recently, a copy of the paper for publication. I was so sure that it would be published I ventured to state that it would appear in an early issue of the *Archives of Ophthalmology*. I had made it a point to celebrate my thirty-seventh birthday anniversary by the presentation of the paper to the Academy of Medicine.

In forwarding the paper to Dr. Herman Knapp, I requested that it be given as early publication as possible, for the reason that some other man, who might be working on the same line, might antedate me in publication. I was only a few days older when I found, in my morning mail, a letter from Dr. Knapp in which he stated that, since he could not give my paper an early publication, he was returning the copy to me. I wondered then, and I wonder now, if the explanation he gave for returning the copy was his only reason. I thought then and I think now that he judged the paper unsound in teaching and did not wish the *Archives* to give publicity to the supposed errors contained in it. My judgment in this matter may have been wrong.

The hour had struck for the birth of a new special journal, and I at once arranged for its publication. The first type assembled spelt the title of the paper that had been returned. In the first number of the *Record* it went forth to meet its critics in mortal combat, and it survived, for the truth of its teaching was both its helmet and shield.

There are three things of which I am glad:

(1) The return of my paper never made the slightest difference in the personal relationship between Dr. Knapp and myself. We remained the best of friends to the end of his long and useful career. No one had greater admiration for him than I, from my first acquaintance with him to the day of his death, and I revere his memory.

(2) I am glad that the *Record* was started at the time it was, for a few months later, I would not have undertaken the labor and expense of the publication, because of an attack of the bronchial form of grippe from which I did not entirely recover during the five years of my ownership and control of the journal. Having launched the ship it must sail on, and it must bear to my confreres freight that would be of value to them.

(3) I am glad that, at the end of the fifth volume, I found Dr. Casey A. Wood both willing and able to assume ownership and control of the publication, which had grown to be a burden too heavy for me to carry; for all of my time was needed for my teaching in the medical department of Vanderbilt University, and for the practical work of my office and infirmary. At that time my health had not been fully restored.

I mailed No. 12 of volume 5, with the determination to continue the publication of the *Record*, unless I could place it in the hands of some one who could carry it on successfully. Dr. Wood came first into my thinking, and to him only was the *Record* tendered. I rejoiced at the transfer made to one so well known and so capable; and the intervening years, marked by the increased usefulness of the *Record*, have added to my joy.

A short lapse was necessary between the close of volume 5 and the beginning of volume 6. In the first number of the new volume I find another one of my papers, the title being "Image Changes Caused by Astigmatism and by Correcting Cylinders."

In closing this contributed "bit" I must give vent to two expressions, one of congratulation and one of regret:

(1) I most heartily congratulate Dr. Wood on his successful editorial conduct of the *Record*. The twenty-one volumes he has issued have been brimfull of good things for ophthalmologists, everywhere, to think about and to put into practice. (2) I regret that the *Ophthalmic Record*, as an individual entity, is to appear no more; I also regret that the new "merger" is not to be called *The American Ophthalmic Record*. But under any other name a rose would smell as sweet. Great success to the new AMERICAN JOURNAL OF OPHTHALMOLOGY.

When I transferred the *Record* to Dr. Wood, I acted more wisely than I had dreamed, for in doing this I made the *American Encyclopedia of Ophthalmology* a possibility, for I believe that Wood's work on the *Record* incited him to the greater task. If this surmise is correct, the *Record* did not live a life of twenty-six years in vain. Great has been the *Record!* Monumental and colossal is the *Encyclopedia!* G. C. SAVAGE.

BOOK NOTICES.

Greenwood, Allen; de Schweinitz, George E.; and Parker, Walter R. MILITARY OPHTHALMIC SURGERY, Medical War Manual, No. 3. Authorized by the Secretary of War, under the supervision of the Surgeon General and the Council of National Defense. Philadelphia and New York: Lea and Febiger. 1917. Price, $1.50.

This little hand-book of 115 pages contains suggestions helpful to Medical Officers who have to deal with the special ophthalmic problems in daily routine of active Army Medical work, especially in the dressing stations and hospitals throughout the War Zone.

Is is in no sense a complete treatise. The conditions dealt with in Major Greenwood's essay are those of wounds of the eyeball, perforating and penetrating wounds of the eye, traumatic cataract, penetrating wounds of the orbit, wounds of the eyelids, prophylaxis of the eye, conditions that are an express or diagnostic symptom of disease or injuries elsewhere. Notes on psychoneurosis and refraction are given. The implantation of glass globes in enucleation is advised, and stress is laid upon the Kuhnt keratoconjunctival plastics for ulceration and perforating wounds of the cornea.

The principal duty of the Field and War Zone Surgeon is to repair and clean the wound with removal of foreign bodies. The first reparation of the tissue is the most essential for the cosmetic and ultimate economic results. Plastics may be well left for the Base Hospital, far removed from the firing zone. An interesting and valuable contribution is that of the arm magnet, which is slung over the operator's shoulder and may be used for most purposes of removal of magnetic foreign bodies.

The article by Major de Schweinitz on Trachoma and Common Forms of Conjunctivitis is quite complete, and is written in his inimitable style. It is really a practical treatise on the subject.

The article on Examination of Malingerers, by Major Parker, contains all the well known tests, is well and succintly written; and is a reliable guide for such examination. These chapters are of special value to the officers conducting cantonment examinations.

A short syllabus of terms of diseases, injuries and eye operations, with an index, is appended. H. V. W.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY, Volume 15. Fifty-third Annual Meeting, 1917. 8vo. 332 pages, 16 plates, 14 ill. Published by the Society, William M. Sweet, Secretary, Philadelphia.

These transactions are not so well known to the ophthalmologists of

America as they should be. Heretofore they have been published in annual parts unbound, three or more of these parts making one volume. Hence it is that the proceedings of the fifty-third meeting are numbered only volume fifteen. This year they appear in a substantial, neatly bound volume; and hereafter each year, such a volume is to be issued.

Although each part has cost each member of the Society five dollars or more of his annual dues, they have been sold at a much lower price, and they ought to appear in the working library of every American ophthalmologist who accumulates a library. They contain a large part of the best contributions to ophthalmic literature that have emanated from American authors.

With perhaps one exception, the American Ophthalmological Society is the oldest special medical society in the world. It is certainly the oldest ophthalmologic society among English speaking peoples. And while it has failed to develop into a truly national organization, the scientific and literary excellence of its transactions have maintained a very high standard.

For the last years, there have been included with the papers and discussions that have constituted the scientific proceedings of the annual meeting, the theses of candidates accepted into membership in the Society. Those of Dr. Harvey Howard and Dr. William Tarun, published in the present volume, give promise that the young men now gaining entrance to the Society are capable of maintaining the high standard of these transactions in the future.

E. J.

CORRESPONDENCE.

STAINING CORNEAL ULCERS.

AMERICAN JOURNAL OF OPHTHALMOLOGY:

They say that "Necessity is the mother of invention," and I have been wondering if the failure of the dispensary of the Base Hospital here to fill a prescription for fluorescein to stain a corneal ulcer has led me into something new and good, or whether my new corneal ulcer stain is old and has been tried and discarded for some valid reason.

In casting about for a stain, I hit on a two per cent aqueous solution of methylene blue. The results were startlingly beautiful. To the very edge of the most minute abraded area, the stain was intense and distinct. Not knowing if the blue would smart, I preceded it with one drop of a two per cent solution of cocain. There was no pain. In an hour, the stain was about half washed away, and in two hours it was all gone.

The next day, I used it without cocain and there was no pain, and again the stain was perfect. Neither the healthy cornea nor the conjunctiva take the stain at all.

There was some conjunctival inflammation; but I could not say that it was due to the stain or increased by it. The stain was immediately washed out with boracic acid (two per cent) solution. If it gets on the skin, it stains it; but that easily washes off; or if vaseline is used on the skin of the lower lid and side of nose, no stain results. I am not treating the ulcer, serpiginous in character, with any other medication, as I want to see if the stain has any curative value.

This is certainly a busy place. We see from forty to one hundred and seventy-five patients in my section every day, and some days the clinics remind me of Vienna, New York, or Chicago. The only eye operations so far are for pterygia; but tonsil and septal work is without end.

Sincerely,

A. C. MAGRUDER,
Captain, M. R. C.

Camp Doniphan, Oklahoma.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colo. As these columns go to press on the 30th of the month contributors should send in their items before that date. The following gentlemen have consented to supply the News Item Editor with the news from their respective sections: Dr. James A. Black, San Francisco; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. H. Kress, Los Angeles; Dr. W. Holbrook Lowell, Boston; Dr. Henry R. Skeel, New York City; Dr. Chas. P. Small, Chicago; Dr. Geo. M. Waldeck, Detroit; Dr. Oscar Wilkinson, Washington. It is desirable that this staff shall be enlarged until every city of importance in the United States shall be covered, as well as all foreign countries. Volunteers are therefore needed, and it is hoped that they will respond promptly to this call.

Dr. J. W. Kimberlin, of Kansas City, Missouri, will go abroad as ophthalmologist, with Base Hospital, No. 28.

Dr. W. W. Blair of Pittsburgh, who heads the Committee on Conservation of Vision of the Pennsylvania Medical Association, has worked out some plans whereby the work may be increased in efficiency.

Dr. Robert Scott Lamb, of Washington, D. C., read a paper before the Shenandoah Valley Medical Society at Winchester, Va., December 18th, 1917, upon "Some Things a General Practitioner Would Do Well to Know About Eyes."

Dr. Burton Chance has been assigned to the Aviation Examining Board at the University of Pennsylvania.

Dr. R. Evatt Mathers, of Halifax, Nova Scotia, writes that, during the recent disaster, in one day he did forty enucleations at the Victoria General Hospital, with three other oculists working just as hard in other hospitals.

The Ophthalmological Society of the United Kingdom will hold its next meeting in London, May 2nd, 3rd, and 4th, 1918. E. Treacher Collins, President, and M. S. Mayou, 30 Cavendish Square, W., Secretary.

The first annual meeting of the shareholders of the British Journal of Ophthalmology, Ltd., was held Dec. 12, 1917. In addressing the meeting the chairman, Mr. J. B. Lawford, said that the directors felt well pleased with the progress of the company to date. The financial position was sound and the outlook encouraging. The list of subscribers exceeded their expectation, and he thought they were justified in stating that the journal had been an undoubted success. Messrs. J. Herbert Parsons and W. G. Laws were elected to the vacancies created by the retirement of Sir Anderson Critchett and Mr. J. Gray Clegg.

A campaign to raise $100,000 for the Maryland workshop for the blind was started January 14, in Baltimore, to take care of the increased number of blind, and blind soldiers returned from the front. It is to be equipped with new machinery and other facilities for a workshop for the blind.

Dr. George L. Strader of Cheyenne, Wyoming, is spending the winter at Hollywood, California, and is reported to be much improved in health.

Denver has been selected as the next meeting place of the American Academy of Ophthalmology. The date of meeting will be some time in August.

We learn with regret of the death of Mrs. Finnoff, wife of Captain William C. Finnoff, formerly of Denver, now stationed at Camp Funston.

More than 210 persons were blinded through the terrible explosion which occurred in Halifax. A committee for relief work among such sufferers was instituted through the efforts of Sir Frederick Fraser, Superintendent for the School for the Blind at Halifax.

Dr. D. S. Hager has completed the annual re-examination for sight, color-sense and heart of the trainmen of the Santa Fe System, on the eastern and western lines.

The indictment against Dr. George B. Schwachtgen, Aurora, for failure to report a case of ophthalmia in an infant, was nolle prossed at the request of State's Attorney Philips of Elgin.

Dr. V. A. Chapman of Muskegon, Mich., announces that he has taken charge of Dr. Nelson M. Black's practice. The latter has been called to Washington for service on the Council of National Defense.

Stähli of Zurich, who has been especially interested in the field of "labyrinthine ophthalmostatics," calls attention to the fact

that in a few years the centennial of the discoveries by Flourens in this line can be celebrated.

The Council of the British Medical Association has awarded the Middlemore Prize for 1917 to William Clark Souter for his essay on "Disorders of the Eye and of Its Functions Induced by War Injuries Not Directly Affecting the Eye."

CHICAGO NOTES.

Capt. Chas. M. Robertson is detailed in Chicago for the special research work in the aviation department.

Dr. Sydney Walker, Jr., P. A. Surgeon in the 6th Regiment, Marine Corps, is at present on duty in France.

Dr. Herbert Walker has been given a captain's commission, M. R. C., and is to be assigned to the ophthalmologic department, Base Hospital 22, in Milwaukee.

Major William H. Wilder has been ordered home from Camp Taylor to the inactive list. Dr. T. D. Allen, who has been Dr. Wilder's office assistant for the past six months, is a first lieutenant, M. R. C., and has left with Hospital Unit No. 13, for Camp McPherson, Atlanta, Ga.

Major Casey Wood has been transferred from Chief of the Ophthalmic Service, and Head of the Section of Head Surgery, Camp Sherman, Ohio, to have charge of the Literary Department, Special Hospitals, and Reeducation of the Returned Disabled Soldier, on the staff of the Surgeon-General in Washington.

Major C. A. Leenheer is on active duty at Camp Houston, Texas.

Dr. Alexander S. Rochester is on active duty somewhere in France.

Dr. Elzear LaMothe has just received a First Lieutenant's commission, M. R. C.

Capt. Charles J. Swan has been sent to Philadelphia for special study in the department of brain surgery.

At the annual meeting of the Chicago Ophthalmological Society held on January 21st, the following officers were elected for the ensuing year: President, Heman H. Brown; vice-president, Thomas O. Edgar of Dixon, Illinois; secretary-treasurer, Alfred Murray; councilor, J. F. Burkholder. Major Frank Billings was the guest of the evening and gave to the members of the society a most illuminating talk on the present situation in Russia. While in that country recently as head of the American Red Cross Mission, Dr. Billings came in close touch with some of the most representative leaders in the various governmental and army departments, such as Kerensky, Korniloff, Miliukoff and others, and through this personal knowledge thus gained, to interpret very vividly the actual conditions there, which are so difficult for the uninstructed to grasp.

Captain R. R. Cruise has devised a visor made of a mesh of steel rings closely linked together, and fastened to the helmet. The Ophthalmological Society of the United Kingdom in endorsing its use, states that it believes it would prevent at least 50 percent of the eye injuries received in warfare. The visor has received the strong approval of ophthalmic surgeons in the field and at home.

Attention has been called to a nostrum put on the market by the Valmas Drug Company, Detroit, under the name of Bon-Opto. This "eye medicine" is sold under the claim that it will "Make Weak Eyes Strong," that it "Strengthens Eyesight 50 Per Cent in One Week's Time in Many Instances," etc. The state chemists of New Hampshire state that Bon-Opto contains:

Sodium Chloride	39.2
Zinc Sulphate	6.83
Boric Acid	39.69
Menthol	a small amount

The retiring President read the following Roll of Honor of members of the Chicago Ophthalmological Society now in active service and those who have received commissions but have not been called to duty:

Majors.

Maj. Casey A. Wood, Surgeon General's Office, Washington, D. C.

Maj. William H. Wilder, Camp Taylor, Louisville, Ky., Base Hospital.

Maj. Thomas A. Woodruff, Fort Gredel, Rhode Island.

Maj. Cornelius A. Leenheer, 108 Engineer Corps, Camp Logan, Houston, Tex.

Maj. George F. Suker, Camp Custer, Battle Creek, Mich., Base Hospital.

Maj. Nelson M. Black, Surgeon General's Office, Washington, D. C.

Maj. Frank C. Todd, Camp Dodge, Iowa, Base Hospital.

Captains.

Capt. Francis Lane, In Charge of Medical Examining Unit, Aviation Corps, Chicago.

Capt. Ephraim K. Findlay, Post Hospital, Fort Snelling, Minn.

Capt. Harry S. Gradle, Base Hospital, Camp Grant, Rockford, Ill.

Capt. Sydney Walker, Jr., Marine Corps, now in France.

Capt. Herbert Walker, Base Hospital, Unit No. 22, Milwaukee, Wis.

Capt. Charles M. Robertson, detailed for special research work in aviation, Chicago.

Capt. Charles J. Swan, detailed to the University of Pennsylvania, Philadelphia, for special work in brain surgery.

First Lieutenant Charles P. Small, Medical Examining Unit, Aviation Section, Signal Corps, Chicago.

First Lieutenant Alexander S. Rochester, now in France.

Commissioned But Not As Yet Assigned to Active Service.

Capt. Charles F. Burkhardt, Effingham, Ill.

Capt. George A. Darner, Aurora, Ill.

First Lieut. E. LaMothe, Chicago, Ill.

LOS ANGELES NOTES.

Los Angeles is one of the cities which Major Isaac Jones decided upon as a place where an examining board for aviation candidates might be well established.

The Los Angeles Medical Department of the University of California was able to offer facilities which were very well adapted for this work, and at a conference of the initial group which had been gotten together, Major Jones stated that he would strive to have Captain William H. Roberts of Pasadena, who was on detail in the East, assigned to Los Angeles to be at the head of this examining unit.

It was hoped to establish a complete medical board, the candidates at the present time still being obliged to go to San Diego for general, physical, mental and moral examinations, and then receiving papers to present themselves at Los Angeles. The number of applicants who have been examined have on some days been extremely large, but the work has gone steadily forward, Captain Roberts being assisted by a group of a dozen or more colleagues.

The Eye, Ear, Nose and Throat section of the Los Angeles County Medical Association has been having a series of very interesting meetings recently. The officers of this section are Dr. George W. McCoy, president; Dr. C. G. Stivers, secretary, and Dr. C. H. Montgomery, councilor. In future issues note will be made of the proceedings of the Section.

OPHTHALMIC LITERATURE.

Under this head continuing the "Index of Opththalmology" heretofore published in **Ophthalmic Literature** will be found the subjects of all published papers received during the last month, that bear to an important extent upon ophthalmology. The subject is indicated rather than the exact title given by the author. Where the original title has been in a foreign language it is translated into English. The journal in which the paper is published will indicate the language of the original.

The names of the different journals are indicated by abbreviations which generally correspond to those used by the **Index Medicus**, the **Journal of the American Medical Association**, and the **British Journal of Ophthalmology**. We will from time to time publish the list of ophthalmic journals, with the abbreviations used for each. Often a single letter discriminates between journals published in different languages. Thus "Arch. of Ophth." refers to the Archives of Ophthalmology, published in English; "Arch. d'Opht.," indicates the French Archives d'Ophtalmologie; "Arch. de Oftal." refers to the Archivos de Oftalmologia Hispano-Americanos, while "Arch. di Ottal." indicates the Italian Archivio di Ottalmologia.

In this index of the literature the different subjects are grouped under appropriate heads; so that all papers bearing on the same, or closely related subjects, will be found in one group. The succession of the groups is the same from month to month, and identical with that of the Digest of the Literature. Where a paper clearly refers to two subjects that belong in different groups, it will be noticed in both groups.

Each reference begins with the name of the author in heavyfacè type. This is followed by the subject of his paper. Then in brackets a number with (ill.) indicates the number of illustrations, or a number with (pl.) the number of plates illustrating the article, (col. pl.) indicates colored plates. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that the paper was read before some society and gave rise to a discussion which is published with it.

It is desired to notice every paper as soon as possible after it is published. Readers will confer a favor by sending titles they notice have been omitted, with journal and page of publication; and of their own papers, sending either a copy of the journal in which each appeared, or a reprint. These should be sent as soon as possible to 318 Majestic Building, Denver, Colorado.

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Records of Visual Acuity. Amer. Jour. Ophth., v. 1, p. 71.

Report of Committee on Standardization of Illumination of Test-Cards and Perimeters. Amer. Ophth. Soc., v. 15, p. 324.

Tests of Visual Acuteness. Jour. Amer. Med. Assn., v. 70, p. 259.

Walker, C. B. Quantitative Perimetry. (9 Fig., 3 pl.) Trans. Amer. Ophth. Soc., v. 15, p. 166. Arch. of Ophth., v. 46, p. 537.

Wells, D. W. Adaptability of Phoro-optometer Stereoscope for Haitz and Bissell Charts. Amer. Jour. Ophth., v. 1, p. 20.

Wescott, C. D. Visual Examinations. Railway Surg. Jour., v. 24, p. 1.

THERAPEUTICS.

Fergus, F. Salvarsan and Other Remedies in Ophthalmic Practice. Arch. of Ophth., v. 47, p. 29.

Santos Fernandez, J. Cure of Nonsyphilitic Affections of Eye by Mercurials. Arch. de Oft., v. 17, p. 113. Amer. Jour. Ophth., v. 34, p. 374.

Smith, C. L. Eserin in Ophthalmic Practice. Jour. Kansas Med. Soc., v. 18, p. 11.

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Wood, H. Technic in Surgery of Eye, Ear, Nose and Throat. South. Pract., v. 39, p. 295.

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Howe, L. Ergograph Registration of Fatigue in Accommodation. (Dis.) Amer. Ophth. Soc., v. 15, p. 145.

Schrant, J. H. Seat of Astigmatism. Southwest Jour. Med. and Surg., v. 25, p. 283.

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Briggs, H. H. Tendon Shortening. Internat. Jour. Surg., v. 30, p. 394.

Bonner, H. M. Hyperopia, One Cause of Crossed Eyes. Charlotte Med. Jour., v. 22, p. 13.

Hassin, G. B. Hemiplegia with Weber's Syndrome. Jour. Amer. Med. Assn., v. 69, p. 2169.

Heydt, R. von der. Management of Squint. Chicago Ophth. Soc., Oct. 15, 1917. Amer. Jour. Ophth., v. 1, p. 63.

Jones, I., and Langdon, H. M. Relation Between Eye and Ear Shown by Bárány Tests. Sec. on Ophth., Coll. Phys., Phila., Oct. 18, 1917. Amer. Jour. Ophth., v. 1, p. 55.

Simpson, J. H. Etiology of Squint. Internat. Jour. Surg., v. 30, p. 383.

Theobald, S. Chief Function of Oblique Muscles of Eye (1 ill.). Bull. Johns Hopkins Hosp., v. 29, p. 15.

Wells, D. W. Exophoria and Convergence Treated by Fusion Training (236 cases). Jour. Ophth., Otol. and Laryngol., v. 23, p. 806.

Williams, C. E. Harman's Reefing Advancement and Jig-saw Operation. Jour. Ophth., Otol. and Laryngol., v. 23, p. 298.

CONJUNCTIVA.

Jefferson, F., and Armstrong, W. E. M. Treatment for Conjunctivitis. Jour. Roy. Army Med. Corps, v. 29, p. 112.

Maxey, E. E. Primary Syphilis of Palpebral Conjunctiva. (Bibl.) Amer. Jour. Ophth., v. 1, p. 13.

Mohr, M. Conjunctivitis from Typhoid Bacilli. Klin. M. f. Augenh., 1916, p. 523. Arch. of Ophth., v. 47, p. 92.

Pascheff. Infectious Necrotic Conjunctivitis. Heidelberg Ophth. Cong., 1916. Arch. of Ophth., v. 47, p. 93.

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Roenne, H. Optochin in Treatment of Chronic Conjunctivitis. Klin. M. f. Augenh. 1916, p. 301. Arch. of Ophth., v. 47, p. 93.

Roth, A. W. Total Symblepharon Resulting from Trachoma. Jour. Okla. Med. Assn., v. 10, p. 230.

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Shastid, T. H. Composite Ophthalmia Neonatorum Law. Amer. Jour. Ophth., v. 1, p. 43.

Spitze, E. C. Parinaud's Conjunctivitis. Amer. Jour. Ophth., v. 34, p. 364.

Stargardt, K. Etiology of Phlyctenular Ophthalmia. Heidelberg Ophth. Cong., 1916. Arch. of Ophth., v. 47, p. 93.

Tuchler, A. S. Treatment of Inflammation of Eyes. Calif. Eclec. Med. Jour., v. 39, p. 4.

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Jackson, E. Extreme Conical Cornea. Colo. Ophth. Soc., Nov. 17, 1917. Amer. Jour. Ophth., v. 1, p. 60.

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Wood, C. G. R. Etiology of Sympathetic Ophthalmitis. Brit. Jour. Ophth., v. 2, p. 27.

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